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American National Standard  
for Information Systems –  
  
Dictionary for Information Systems

Secretariat

**Computer and Business Equipment Manufacturers Association**

Approved July 19, 1990

**American National Standards Institute, Inc.**

This DICTIONARY has been adopted for Federal Government use as a basic reference document to promote a common understanding of information processing terminology.

Details concerning the specific use of this DICTIONARY are contained in Federal Information Processing Standards Publication 11-3, Guideline: American National Dictionary for Information Systems. For a complete list of the publications available in the Federal Information Processing Standards Series, write to the Standards Processing Coordinator (ADP), National Institute of Standards and Technology, Gaithersburg, MD 20899.

## Foreword (This Foreword is not part of American National Standard X3.172-1990.)

The communication of facts and ideas depends upon a mutual understanding of terminology. This is particularly true in the rapidly growing field of information processing systems, in which there is a continuing need for a comprehensive source of agreed-upon technical terms and definitions.

By direction of the American National Standards Institute – Accredited Standards Committee on Information Processing Systems, X3, the Technical Committee on Vocabulary, X3K5, prepared this American National Standard Dictionary for Information Systems (ANSDIS). The dictionary is based on the American National Dictionary for Information Processing Systems, X3/TR1-82 and its predecessors, the American National Dictionary for Information Processing, X3/TR-1-77, and the American National Standard Vocabulary for Information Processing, ANSI X3.12-1970. The dictionary was developed by studying the use of terms throughout the field of information systems including computers, data communications, data processing, text processing, and related fields. The ANSDIS also includes terms and definitions from the ISO Vocabulary – Information Systems, developed by ISO/IEC JTC 1/TC 97/SC1: Technical Committee 97 (Information Processing Systems), Sub-committee 1 (Vocabulary) of Joint Technical Committee 1 of the International Organization for Standardization and the International Electrotechnical Commission.

Advances in the field of information systems usually require changes in terminology. Requests for interpretation, suggestions for improvement or addenda, or defect reports are welcome. They should be sent to the X3 Secretariat, Computer and Business Equipment Manufacturers Association, 311 First Street, NW, Suite 500, Washington, DC 20001-2718.

The ANSDIS is intended to define terms in a way that is appropriate and useful for the layman. The dictionary is not in any way intended to supplement or supersede definitions of the same or similar terms that may appear in other ISO or ANSI standards. For definitions specific to particular areas of information systems technology, refer to the applicable ANSI or ISO standards.

This standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Information Processing Systems, X3. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the X3 Committee had the following members:

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**Others who contributed to the work of this standards:**

Saul Gorn ..... University of Pennsylvania  
Donald J. McCaffrey, X3H4 Vocabulary Representative

X3K5 wishes to express its appreciation to all those persons, too numerous to mention, who have made contributions to the ANSDIS. Special appreciation is extended to Josephine L. Walkowicz of the National Bureau of Standards and past Chair of X3K5 for producing and editing the manuscript for this edition, and to John R. Wood of IBM for production of computer art and camera-ready copy.

## Introduction

### Sequence of Entries

The sequence of entries in this dictionary is determined alphabetically on a letter-by-letter basis. Only the letters of the alphabet are used to determine the sequence of entries; special characters and spaces between words are ignored.

### Organization of Entries

An entry consists of a single-word or multiple-word term or the abbreviation or acronym for a term, followed by a commentary. A commentary includes one or more items (definitions or references) and is organized as follows:

1. An item number, if the commentary contains two or more items.
2. A source label, for example, (ISO), that precedes the definition and identifies the originator of the definition.
3. A usage label, indicating the area of application of the term, for example, "In programming," or "In text processing."
4. A descriptive phrase, stating the basic meaning of the term. The descriptive phrase is assumed to be preceded by "the term is defined as..." The part of speech being defined is indicated by the opening words of the descriptive phrase: "To..." indicates a verb and "Pertaining to..." indicates a modifier. Any other wording indicates a noun or noun phrase.
5. Annotative sentences, providing additional or explanatory information.
6. References, directing the reader to other entries or items in the dictionary.

### References

The following cross references are used in this dictionary:

**Contrast with.** This refers to a term that has an opposite or substantively different meaning.

**Synonym for.** This indicates that the term has the same meaning as a preferred term, which is defined in its proper place in the dictionary.

**Synonymous with.** This is a backward reference from a preferred, defined term to all other terms that have the same meaning.

**See.** This refers the reader to multiple-word terms that have the same last word.

**See also.** This refers the reader to related terms that have a related, but not synonymous, meaning.

**Deprecated term for.** This indicates that the term should not be used. It refers to a preferred term, which is defined in its proper place in the dictionary.

## **Selection of Terms**

A term is a word or group of words to be defined. In this dictionary, the singular form of the noun and the infinitive form of the verb are the terms most often selected to be defined. If the term may be abbreviated, the abbreviation is given in parentheses immediately following the term. The abbreviation is also defined in its proper place in the dictionary.

## **Source Identifiers**

Definitions reprinted from the International Organization for Standardization's Vocabulary – Information Processing, ISO 2382, are identified by the symbol (ISO) preceding the definition.

## **Identification of Defined Terms**

In definitions, the first occurrence of a term that is defined elsewhere in the dictionary is highlighted in italics. In some case, such as *data processing*, a multiple-word term is defined. In other cases, each individual word of a multiple-word term is defined, for example, in *program-addressable*, the words *program* and *address* are defined separately. Although the noun or verbal forms of terms are usually defined, other grammatical forms of defined terms are also italicized.



# A

**abbreviated address calling.** (ISO) *Calling* that enables a *user* to employ an *address* having fewer *characters* than the full *address* when initiating a *call*. *Networks* may allow a *user* to designate a given number of abbreviated *address codes*. The allocation of abbreviated *address codes* to a *destination* or group of *destinations* may be changed as required by means of a suitable procedure.

**abbreviation.** An *ordered* and shortened representation of *data* that retains the identity of the *data element* that is represented. Contrast with *data code*.

**ABEND.** *Abnormal end*.

**abnormal end.** Synonym for *abnormal termination*.

**abnormal termination.** (ISO) An unplanned cessation of *processing*. Synonymous with *abnormal end*.

**abort.** (ISO) To terminate, in a controlled manner, a *processing activity* in a *computer system* because it is impossible or undesirable for the activity to proceed.

**absolute address.** (1) (ISO) An *address* in a *computer language* that identifies a *storage location* or a device without the use of any intermediate reference. Synonymous with *specific address*. (2) An *address* that is permanently assigned by the machine designer to a *storage location*.

**absolute coding.** *Coding* that uses *computer instructions* with *absolute addresses*. Synonymous with *specific coding*.

**absolute command.** (ISO) In *computer graphics*, a *display command* that causes the *display device* to interpret the *data* following the command as *absolute coordinates*.

**absolute coordinate.** (ISO) One of the pair of coordinates that identify the position of an *addressable point* with respect to the origin of a specified coordinate system.

**absolute error.** (1) (ISO) The algebraic result of subtracting a true, specified, or theoretically correct value from the value computed, observed, measured or achieved. (2) The amount of *error* expressed in the same units as the quantity that contains the error. (3) Loosely, the absolute value of the *error*, for example, the magnitude of the error without regard to its algebraic sign.

**absolute loader.** A *routine* that reads a *computer program* into *main storage*, beginning at the *assembled origin*. See also *relocating loader*.

**absolute vector.** (1) (ISO) In *computer graphics*, a *vector* whose start and end points are specified in *absolute coordinates*. (2) See *incremental vector*.

**abstract symbol.** (1) (ISO) A *symbol* whose meaning and use have not been determined by general agreement, but have to be defined for each application of the symbol. (2) A *symbol* whose form does not suggest its meaning, but must be defined for each specific set of applications.

**acceptance test.** (ISO) A test of a *system* or *functional unit*, usually performed by *users* on their premises after *installation*, with the participation of the vendor to ensure that contractual requirements are met.

**access.** (1) To obtain the use of a *resource*. (2) The use of an *access method*. See *direct access*, *indexed access*, *indexed sequential access*, *random access*, *serial access*. (3) See also *access control*.

**access arm.** (ISO) In a *magnetic disk unit*, an arm on which *magnetic heads* are mounted.

**access control.** A technique used to define or restrict the rights of individuals or application programs to obtain *data* from, or place *data* onto, a *storage device*.

**access controller.** In an *information resource directory system* with *entity-level security*, a pair of *locks*, one for *read access*, the other for *write access*. Locks may be used for other purposes, such as to permit *execution*.

**access control lock.** Synonym for *privacy lock*.

**access control key.** Synonym for *privacy key*.

**access key.** In an *information resource directory system* with *entity-level security*, an *authorization* to perform a set of operations on an *entity* secured by a *lock*.

**access lock.** Synonym for *privacy lock*.

**access mechanism.** (ISO) A mechanism that is responsible for moving an *access arm* or a comb. Synonymous with *actuator*.

**access method.** The technique that is used to locate *data stored* on a physical medium.

**access mode.** A technique that is used to obtain a particular *logical record* from, or to place a particular *logical record* into, a *file* assigned to a *mass storage device*.

**access name.** In an *information resource dictionary*, the name by which an *entity* is known to the *user interfaces*. It is the combination of an *assigned access name* and *version identifier* that together serve as the primary identifier of each entity.

**access path.** (1) A chain of *addresses* that leads to the desired *data*. (2) The procedure used by a *database management system* to access *data stored* in a *database*.

**access permission.** (ISO) All of a *user's access rights*.

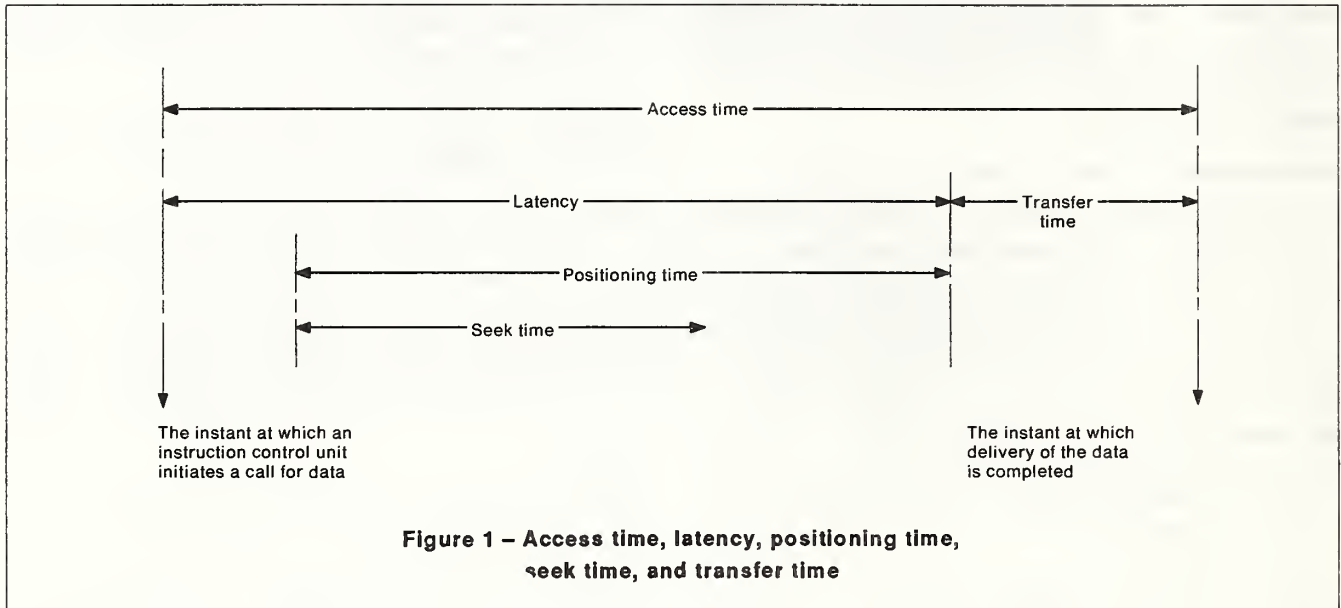
**access right.** (ISO) The right granted to a *user* to access a *resource* and use it in a particular manner; for example, the right to *read* a *file*, the right to *write* a *file*, the right to *delete* a *file*, the right to place files on a *volume*, the right to cause the execution of an *object program*.

**access time.** (1) (ISO) The time interval between the instant at which a *call* for data is initiated and the instant at which the delivery of data is completed; access time equals *latency* plus *transfer time*. (2) See *mean access time*. (3) See Figure 1.

*nection* has been set up. (2) A *transmission control character* transmitted by a receiver as an affirmative response to a sender; an acknowledge character may also be used as an *accuracy control character*. (3) See *negative acknowledge character*.

**acoustic coupler.** A device that interconnects a *communicating unit* with a telephone handset by converting sound *signals* to or from electrical signals.

**acoustic delay line.** A *delay line* whose operation is based on time of propagation of sound waves in a



**accounting machine.** (1) A *keyboard-actuated machine* that prepares accounting records. (2) A machine that *reads data* from external storage media, such as cards or tapes, and *automatically* produces accounting records or tabulations, usually on *continuous forms*. (3) See *electrical accounting machine*.

**account number.** See *primary account number*.

**accumulator.** (ISO) A *register* in which one *operand* can be *stored* and subsequently replaced by the result of the store operation.

**accuracy.** (1) (ISO) A quality of that which is free of error. (2) (ISO) A qualitative assessment of freedom from error, with a high assessment corresponding to a small error.

**accuracy control character.** A *control character* used to indicate whether the *data* with which it is associated are in error, are to be disregarded, or cannot be represented on a particular device. Synonymous with error control character.

**ACK.** The *acknowledge character*.

**acknowledge character (ACK).** (1) A *transmission control character* transmitted by a station as an affirmative response to the station with which the con-

given medium. Synonymous with sonic delay line.

**acoustic storage.** A *storage device* consisting of *acoustic delay lines*.

**action.** (1) In a *conceptual schema language*, one or more *elementary actions* that, as a unit, change a collection of sentences into another collection of sentences in the *information base* or in the conceptual schema, and make known a collection of sentences present in the information base or conceptual schema. (2) See *elementary action*, *permissible action*.

**action description.** In a *conceptual schema language*, a *linguistic object* describing an *action* or *permissible action*.

**action entity world.** In a *conceptual schema language*, a collection of *entities* of interest that is described in an *actual information base* and its *conceptual schema*.

**activity content.** (ISO) Synonym for *activity inventory*.

**activity inventory.** (ISO) In an *information processing system*, all of the *functions* and *processes* and their interdependencies. Synonymous with activity content.

**actual information base.** In a *conceptual schema language*, the *information base* that exists in a specified



instance or period of time and that expresses the additional *propositions* other than the necessary ones, that hold for an *entity world*.

**actual parameter.** In *programming languages*, a *language object* that appears in a *procedure call*, and that is associated with the corresponding *formal parameter* for use in the execution of the *procedure*.

**actuator.** (ISO) Synonym for *access mechanism*.

**Ada.** A general-purpose high-level *procedure-oriented language*, originally developed under the aegis of the U.S. Department of Defense to provide a means, independent of proprietary *machine languages*, for implementing *embedded systems*; it features *structured programming*, *data structures* with *strong typing*, *multitasking*, and facilities for *object-oriented programming*.

**ADC.** (ISO) *Analog-to-digital converter*.

**add.** See *false add*.

**adder.** (1) (ISO) A device whose *output data* are a representation of the sum of the *numbers* represented by its *input data*. (2) See *full adder*, *half adder*, *parallel adder*, *serial adder*, *three-input adder*, *two-input adder*.

**adder-subtractor.** (ISO) A device that acts as an *adder* or *subtractor* depending upon the control *signal* received; the adder-subtractor may be constructed so as to yield a sum and a difference at the same time.

**addition.** See *parallel addition*, *serial addition*.

**add mode.** (ISO) In addition and subtraction operations, a mode in which the *decimal marker* is placed at a predetermined location with respect to the last digit entered.

**address.** (1) (ISO) A *character* or group of characters that identifies a *register*, a particular part of *storage*, or some other *data source* or destination. (2) (ISO) To refer to a device or a *data item* by its address. (3) See *absolute address*, *base address*, *direct address*, *effective address*, *immediate address*, *indexed address*, *indirect address*, *instruction address*, *multiaddress*, *real address*, *relative address*, *relocatable address*, *symbolic address*, *virtual address*.

**addressability.** (1) (ISO) In *computer graphics*, the number of *addressable points* on a *display surface* or in *storage*. (2) In *micrographics*, the number of *addressable points*, within a specified *film frame*, computed as follows: the number of addressable horizontal points by the number of addressable vertical points, for example, 4000 by 4000.

**addressable point.** (ISO) In *computer graphics*, any point of a device that can be addressed.

**address format.** (1) The arrangement of the *address parts* of an *instruction*; the expression plus-one is fre-

quently used to indicate that one of the addresses specifies the *location* of the next instruction to be executed. (2) The arrangement of *address parts* that allows identification of those parts required to indicate a *channel*, a device, a *cylinder*, a *read/write head*, or a *record* on a *magnetic disk storage device*.

**addressing.** See *implied addressing*, *relative addressing*, *repetitive addressing*, *symbolic addressing*.

**address modification.** Any arithmetic, logic or syntactic operation performed on an *address*.

**address part.** (ISO) A part of an *instruction* that usually contains only an *address* or part of an address.

**address register.** (1) A *register* in which an *address* is stored. (2) See *base address register*, *instruction address register*.

**address space.** The range of *addresses* available to a *computer program*.

**address track.** A *track* that contains *addresses* that may be used to locate *data* on other tracks of the same *data medium*.

**address translator.** (ISO) A *functional unit* that transforms *virtual addresses* into *real addresses*.

**adjacency.** In *character recognition*, a condition in which the *character* spacing reference lines of two consecutively-printed characters printed on the same line are separated by less than a specified distance.

**adjacent domains.** (ISO) Two *domains* interconnected by means of *adjacent nodes*.

**adjacent nodes.** (ISO) Two *nodes* connected without any *intermediate nodes*.

**adjust.** See *right-hand margin adjust*.

**adjust-text mode.** (ISO) A mode in which a *user* can reformat *text* to accommodate specified *line lengths* and *page sizes* and adjust line endings.

**administrator.** See *data administrator*, *database administrator*, *dictionary administrator*, *document administrator*.

**ADP.** *Automatic data processing*.

**ADP system.** Synonym for *computer system*.

**aggregate.** (1) In *programming languages*, a structured collection of *data objects* that forms a *data type*. (2) See *data aggregate*.

**AI.** *Artificial intelligence*.

**aiming circle.** (ISO) Synonym for *aiming symbol*.

**aiming field.** (ISO) Synonym for *aiming symbol*.

**aiming symbol.** (ISO) On a *display surface*, a circle or other pattern of light used to indicate the area in which

the presence of a *light pen* can be detected at a given time. Synonymous with *aiming circle*, *aiming field*.

**air-floating head.** (ISO) Synonym for *floating head*.

**algebra.** See *relational algebra*.

**algebraic language.** An *algorithmic language*, many of whose *statements* are structured to resemble the structure of algebraic expressions; for example, *ALGOL*, *FORTTRAN* statements.

**algebraic manipulation.** The processing of mathematical expressions without concern for the *numeric* values of the symbols that represent *numbers*.

**ALGOL.** A language used to express computer programs by algorithms.

**algorithm.** (ISO) A finite set of well-defined rules for the solution of a problem in a finite number of steps, for example, a complete specification of a sequence of arithmetic operations for evaluating  $\sin X$  to a given precision.

**algorithmic language.** (ISO) An artificial language established for expressing a given class of algorithms.

**alias.** (1) An alternate label; for example, a label and one or more aliases may be used to refer to the same data element or point in a computer program. (2) Synonym for *alternate name*.

**allocation.** See *dynamic resource allocation*, *resource allocation*, *storage allocation*.

**alphabet.** (1) (ISO) An ordered set of all the letters used in a language, including letters with diacritical signs where appropriate, but not including punctuation marks. (2) An ordered set of symbols used in a language; for example, the Morse code alphabet, the 128 ASCII characters.

**alphabetic character set.** (ISO) A character set that contains letters and may contain control characters, special characters, and the space character, but not digits.

**alphabetic code.** (ISO) A code according to which data are represented through the use of an alphabetic character set.

**alphabetic string.** (1) (ISO) A string consisting solely of letters from the same alphabet. (2) A character string consisting solely of letters and associated special characters from the same alphabet.

**alphabetic word.** (1) (ISO) A word consisting solely of letters from the same alphabet. (2) A word that consists of letters and associated special characters, but not digits.

**alphanumeric.** Synonym for *alphanumeric*.

**alphanumeric.** Pertaining to a character set that contains letters, digits, and usually other characters such as punctuation marks. Synonymous with *alphanumeric*.

**alphanumeric accounting machine.** An accounting machine that has a means for entering unlimited alphabetic information.

**alphanumeric character set.** (ISO) A character set that contains both letters and digits, special characters, and the space character.

**alphanumeric code.** (ISO) A code whose application results in a code set whose elements are taken from an alphanumeric character set.

**alphanumeric data.** (ISO) Data represented by letters, digits, and sometimes by special characters and the space character.

**ALU.** The arithmetic and logic unit.

**alternate name.** (1) An alternate label; for example, a label and one or more alternate names may be used to refer to the same data element or point in a computer program. (2) In an information resource dictionary, any name by which an entity is known and that may be associated with more than one entity. (3) Synonymous with *alias*.

**alternate track.** (ISO) A spare track that is used in place of a normal track in the event that the latter is damaged or inoperable. Synonymous with *alternative track*.

**alternative track.** (ISO) Synonym for *alternate track*.

**amplifier.** See *analog input channel amplifier*, *analog output channel amplifier*, *differential amplifier*, *isolated amplifier*, *multirange amplifier*, *nonisolated amplifier*, *operational amplifier*.

**analog.** (1) Pertaining to data consisting of continuously variable physical quantities. (2) See *network analog*.

**analog adder.** (ISO) Synonym for *summer*.

**analog computer.** (ISO) A computer that processes analog data.

**analog data.** (ISO) Data in the form of a physical quantity that is considered to be continuously variable and whose magnitude is made directly proportional to the data or to a suitable function of the data.

**analog divider.** (ISO) A functional unit whose output analog variable is proportional to the quotient of two input analog variables.

**analog input channel.** (ISO) In process control, the analog data path between the connector and the analog-to-digital converter in the analog input subsystem. The path may include a filter, an analog signal multiplexer, and one or more amplifiers.



**analog input channel amplifier.** (ISO) An *amplifier* attached to one or more *analog input channels* that adapts the *analog signal* level to the *input range* of the succeeding *analog-to-digital converter*.

**analog multiplier.** (ISO) A *functional unit* whose *output analog variable* is proportional to the product of two *input analog variables*. This term may also be applied to a device that can perform more than one multiplication, for example, a servo multiplier.

**analog output channel.** (ISO) In *process control*, the *analog data* path between the connector and the *digital-to-analog converter* in the *analog output subsystem*. The path may include a *filter*, a *digital signal multiplexer*, and one or more amplifiers.

**analog output channel amplifier.** (ISO) An amplifier attached to one or more *analog output channels* that adapts the *output signal* range of the *digital-to-analog converter* to the signal level necessary to control the *technical process*.

**analog representation.** (ISO) A representation of the value of a *variable* by a physical quantity that is considered to be continuously variable, the magnitude of the physical quantity being made directly proportional to the variable or to a suitable *function* of the variable.

**analog-to-digital converter.** (ISO) A *functional unit* that converts *data* from an *analog representation* to a *digital representation*.

**analog variable.** A continuously variable *signal* that represents either a mathematical *variable* or a physical quantity.

**analysis.** (1) The methodical investigation of a problem, and the separation of the problem into smaller related units for further detailed study. (2) See *flow analysis*, *functional analysis*, *information analysis*, *numerical analysis*, *requirements analysis*, *system analysis*.

**analyst.** (ISO) A person who defines problems and develops *algorithms* and procedures for solution of the problems.

**analyzer.** See *differential analyzer*, *digital differential analyzer*, *network analyzer*.

**AND.** A *logic operator* having the property that if P is a statement, Q is a statement, R is a statement, then the AND of P,Q,R is true if all statements are true, false if any statement is false. P AND Q is often represented by P.Q, PQ, P $\wedge$ Q. Synonymous with logical multiply.

**AND element.** (ISO) Synonym for *AND gate*.

**AND gate.** (ISO) A *combinational circuit* that performs the *Boolean operation* of *conjunction*. Synonymous with AND element.

**AND operation.** (ISO) Synonym for *conjunction*.

**anisochronous transmission.** (ISO) A *data transmission process* in which there is always an integral number of unit intervals between any two significant instants in the same group; the group may be a *block* or a *character*. Between two significant instants located in different groups, there is not always an integral number of unit intervals.

**annotation.** In a *programming language*, an added descriptive *comment* or explanatory note.

**answering.** (1) (ISO) The process of responding to a *calling station* to complete the establishment of a *connection* between *data stations*. (2) See *automatic answering*, *manual answering*.

**anticipatory buffering.** A technique by which *data* are stored in a *buffer* before they are needed.

**anticipatory paging.** (ISO) The transfer of a *page* from *auxiliary storage* to *real storage* prior to the moment of need.

**aperture.** (1) (ISO) One or more adjacent *characters* in a *mask* that cause the retention of corresponding characters. (2) An opening in a *data medium* or device; for example, an opening in an *aperture card* that combines a *microfilm* with a *punched card*, or an opening in a *multiaperture card*. (3) A part of a *mask* that permits retention of the corresponding portions of *data*.

**aperture card.** A processible card of standard dimensions into which *microfilm frames* may be inserted.

**aperture core.** See *multiaperture core*.

**APL.** A *high-level, general-purpose programming language* for mathematical applications that simplifies notations and the handling of *arrays*.

**application.** (1) A particular kind of work that a *user* performs on a *computer*; for example, a payroll application, an airline reservation system. (2) Shortened form of *application program*.

**application-oriented language.** A *problem-oriented language* whose *statements* contain or resemble the terminology of the occupation or profession of the *user*.

**application problem.** (ISO) A problem submitted by an *end user* that requires *data processing* for its solution.

**application program.** A *program* written by or for a *user* that applies to the user's work; for example, a payroll program, inventory control program, or a statistical analysis program.

**application software.** Software that is designed for one or more *applications*.

**applicative programming language.** A *programming language* whose *statements* are expressed as *functions*, either recursively or in combination with other

functions. Synonymous with functional programming language.

**architecture.** See *computer architecture*.

**archival database.** An historical copy of a *database* saved at a significant point in time for use in *recovery* or *restoration* of the database.

**archive file.** (ISO) A *file* that is part of a collection of files set aside for later research or verification, for security purposes, for historical or legal purposes, or for *backup*.

**archived file.** (ISO) A *file* for which an *archive file* exists.

**archiving.** (ISO) The *storage* of *backup files* and any associated *journals*, usually for a given period of time.

**area.** (1) Two or more contiguous *storage locations*. (2) In the *CODASYL model*, a named subdivision of a *database* to which *records* can be assigned, irrespective of their set membership. Synonymous with *file*, *realm*. (3) A named collection of *records* that may contain occurrences of one or more *record types*.

**argument.** (1) (ISO) An independent *variable*. (2) (ISO) Any value of an independent *variable*; for example, a *search key*, or a *number* that identifies the *location* of a *data item* in a *table*.

**arithmetic and logic unit.** (ISO) A part of a *computer* that performs arithmetic, logic, and related *operations*.

**arithmetic check.** Synonym for *mathematical check*.

**arithmetic operation.** (1) An *operation* that follows the rules of arithmetic. (2) See *binary arithmetic operation*.

**arithmetic overflow.** (ISO) That portion of a *numeric word* that expresses the result of an *arithmetic operation*, by which the length of the word exceeds the *word length* of the space provided for the representation of the *number*.

**arithmetic register.** A *register* that holds the *operands* or the results of operations, such as *arithmetic operations*, *logic operations*, and *shifts*.

**arithmetic shift.** (ISO) A *shift*, applied to the representation of a *number* in a *fixed radix numeration system* and in a *fixed-point representation system*, and in which only the *characters* representing the *fixed-point part* of the number are moved. An arithmetic shift is usually equivalent to multiplying the number by a positive or a negative integral power of the *radix*, except for the effect of any rounding; compare the *logical shift* with the arithmetic shift, especially in the case of *floating-point representation*.

**arithmetic underflow.** (ISO) In an *arithmetic operation*, a result whose absolute value is too small to be

represented within the range of the *numeration system* in use; for example, (1) the condition existing particularly when a *floating-point representation system* is used, when the result is smaller than the smallest non-zero quantity that can be represented; (2) the result that may *underflow* because of the generation of a negative *exponent* that is outside the permissible range.

**arithmetic unit.** (ISO) In a *processor*, the part that performs *arithmetic operations*; sometimes the unit performs both *arithmetic* and *logic operations*.

**array.** (1) (ISO) In a *programming language*, an aggregate that consists of *data objects* with identical *attributes*, each of which may be uniquely referenced by *subscripting*. (2) An arrangement of elements in one or more dimensions. (3) See *programmable logic array*.

**array processor.** (ISO) A *processor* capable of executing *instructions* in which the *operands* may be *arrays* rather than *data elements*. Synonymous with *vector processor*.

**artificial intelligence (AI).** The capability of a device to perform *functions* that are normally associated with human intelligence, such as reasoning, learning, and self-improvement. See also *expert system*, *knowledge base*.

**artificial language.** A *language* whose rules are explicitly established prior to use.

**ascender.** The part of a *character*; for example, the vertical strokes of lowercase *letters* such as b, d, h, and k, that extends above the top edge of lowercase letters such as a, c, or e to the top of the *character box*. Contrast with *descender*.

**ASCII (American National Standard Code for Information Interchange).** The standard code, using a *coded character set* consisting of 7-bit coded *characters* (8-bits including *parity check*), that is used for *information interchange* among *data processing systems*, *data communication systems*, and associated equipment. The ASCII set consists of *control characters* and *graphic characters*.

**assemble.** (ISO) To *translate* a *program* expressed in an *assembly language* into a *computer language* equivalent.

**assemble-and-go.** An operating technique in which there are no stops between the *assembling*, *loading*, and *execution* of a *computer program*.

**assembled origin.** The *address* of the initial *storage location* assigned to a *computer program* by an *assembler*, a *compiler*, or by a *linkage editor*.

**assembler.** (1) (ISO) A *computer program* that is used to *assemble*. Synonymous with *assembly program*.



(2) See *cross-assembler*, *packet assembler/disassembler*.

**assembly language.** (ISO) A computer-oriented language whose instructions are symbolic and usually in one-to-one correspondence with computer instructions, and that may provide other facilities such as the use of *macroinstructions*. Synonymous with computer-dependent language.

**assembly phase.** (ISO) The logical subdivision of a run that includes the execution of an *assembler*.

**assembly program.** (ISO) Synonym for *assembler*.

**assembly time.** (ISO) The elapsed time taken for the execution of an *assembler*.

**assigned access name.** In an *information resource dictionary*, a name, assigned by a user or by the system, that provides unique access to an *entity* when it is first added to the information resource dictionary.

**assigned descriptive name.** In an *information resource dictionary*, a name for an *entity* that is more descriptive than its *assigned access name*.

**assignment.** In *programming languages*, the setting of a *variable* or an *aggregate* to a given value.

**assignment statement.** An *instruction* used to express a sequence of operations, or used to assign operands to specified *variables*, *symbols*, or both.

**association.** Synonym for *relationship*.

**associative storage.** (1) (ISO) A storage device whose storage locations are identified by their contents, or by a part of their contents, rather than by their names or positions. Synonymous with *content-addressable storage*. (2) Storage that supplements another storage.

**assurance.** See *quality assurance*.

**asynchronous operation.** (1) (ISO) An operation that occurs without a regular or predictable time relationship to a specified event; for example, the calling of an *error diagnostic routine* that may receive control at any time during the execution of a *computer program*. (2) A sequence of operations that are executed out of time coincidence with any event. (3) Contrast with *synchronous operation*.

**asynchronous transmission.** (1) (ISO) Data transmission in which the time of occurrence of the start of each character, or block of characters, is arbitrary; once started, the time of occurrence of each signal representing a *bit* within the character, or block, has the same relationship to significant instants of a fixed time frame. (2) Contrast with *synchronous transmission*.

**attaching unit.** See *lobe attaching unit*.

**attachment unit interface.** (ISO) In a *local area network*, the interface between the *medium attachment unit* and the *data terminal equipment* within a *data station*.

**attribute.** (1) (ISO) A property or characteristic of one or more *entities*; for example, color, weight, sex. (2) A property inherent in an *entity* or associated with that *entity* for *database* purposes. (3) See *data attribute*.

**attribute type.** A specified class of *attributes*, each of which is associated in the same way with a member of one class of *entities*. See also *entity type*, *relationship type*.

**audit.** (1) To conduct an independent review and examination of system records and activities in order to test the adequacy and effectiveness of *data security* and *data integrity* procedures, to ensure compliance with established policy and operational procedures, and to recommend any necessary changes. (2) See *computer system audit*.

**audit review file.** (ISO) A file created by executing statements included in a program for the explicit purpose of providing data for auditing.

**audit trail.** (1) (ISO) Data in the form of a logical path linking a sequence of events, used to trace the transactions that have affected the contents of a record. (2) A chronological record of system activities that is sufficient to enable the reconstruction, review, and examination of the sequence of environments and activities surrounding or leading to each event in the path of a transaction from its inception to output of final results.

**authentication.** (ISO) A process used to verify the integrity of transmitted data, especially a message.

**authorization.** The rights granted to a user to access, read, modify, insert, or delete certain data, or to execute certain programs.

**automate.** (ISO) To convert a process or equipment to automatic operation.

**automated data medium.** Synonym for *machine readable medium*.

**automatic.** (ISO) Pertaining to a process or device that, under specified conditions, functions without intervention by a human operator.

**automatic answering.** (ISO) Answering in which the called data terminal equipment automatically responds to the calling signal; the call may be established whether or not the called data terminal is attended.

**automatic calling.** (ISO) Calling in which the elements of the selection signal are entered into the data network contiguously at the full data signalling rate. The selection signal is generated by the data terminal equipment. A limit may be imposed by the design criteria of the network to prevent more than a permitted

number of unsuccessful *call* attempts to the same *address* within a specified period.

**automatic carriage.** A control mechanism for a *type-writer* or other listing device that can *automatically* control the feeding, spacing, skipping, and ejecting of paper or preprinted forms.

**automatic check.** A check performed by equipment built-in specifically for checking purposes. Synonymous with built-in check, hardware check.

**automatic constant function.** (ISO) In a *calculator*, the *function* that allows a *number* *automatically* held to be used repeatedly.

**automatic data processing (ADP).** *Data processing* by means of one or more devices that use common *storage* for all or part of a *computer program*, and also for all or part of the *data* necessary for execution of the program; that execute *user-written* or *user-designated* programs; that perform *user-designated symbol* manipulation, such as *arithmetic operations*, *logic operations*, or *character-string* manipulations; and that can execute programs that modify themselves during their execution. Automatic data processing may be performed by a standalone unit or by several connected units.

**automatic-feed punch.** A *punch* that *automatically* moves *punch cards* from a *card hopper*, along a *card track*, and to a *card stacker*.

**automatic function.** (ISO) A *machine function* or series of machine functions controlled by a *program* and carried out without assistance of an *operator*.

**automatic programming.** The *process* of using a *computer* to perform some stages of the work involved in preparing a *computer program*.

**automatic sequential operation.** (ISO) Synonym for *iterative operation*.

**automation.** (1) (ISO) The implementation of *processes* by *automatic* means. (2) The theory, art, or technique of making a *process* more *automatic*. (3) The investigation, design, development, and application of methods of rendering *processes* *automatic*, self-moving, or self-controlling. (4) See *office automation*.

**auxiliary operation.** An *offline operation* performed by equipment not under control of the *processing unit*.

**auxiliary storage.** (1) *Storage* that is available to a *processor* only through *input/output channels*. (2) In a *microcomputer*, *storage* that is not *memory*; for example, *storage* on *diskettes*, on *streaming tapes*, or on *magnetic tape cartridges*.

**availability.** The ratio of the total time a *functional unit* is capable of being used to the total time the functional unit is required for use.

**available time.** (ISO) From the point of view of a *user*, the time during which a *functional unit* can be used.

**axiom.** In a *conceptual schema language*, any closed *sentence* that is asserted to be considered as such by an authorized source.



## B

**background image.** (ISO) That part of a *display image*, such as a *form overlay*, that is not changed during a particular *sequence of transactions*. Synonymous with *static image*.

**background processing.** The execution of lower priority *computer programs* when higher priority programs are not using the *system resources*.

**backspace.** (1) (ISO) To move a *data medium* backward a specified distance; for example, to move a *punched tape* backward by one row; to move a *magnetic tape* backward by one *block*. (2) Contrast with *space*.

**backspace character (BS).** (ISO) A *format effector* that causes the print or *display position* to move one position backward along the line without producing the printing or display of any *graphic*.

**backup file.** (ISO) A copy of a *file* made for purposes of later *reconstruction* of the file, if necessary. Synonymous with *job-recovery control file*.

**Backus Naur form (BNF).** A *metalanguage* used to specify or describe the *syntax* of a *language* in which each *symbol*, by itself, represents a set of *strings* of symbols. Synonymous with *Backus normal form*.

**Backus normal form.** Synonym for *Backus Naur form*.

**backward channel.** (ISO) A *channel*, associated with the *forward channel*, used for *supervisory* or *error control signals*, but with a direction of *transmission* opposite to that of the *forward channel* in which *user information* is being *transferred*. In case of *simultaneous transfer* of *user information* in both directions, this definition applies with respect to the *data source* under consideration.

**backward recovery.** (ISO) The *reconstruction* of an earlier version of a *file* by using a newer version of *data* recorded in a *journal*.

**balanced error.** (ISO) A set of *errors* whose mean value is zero.

**balanced merge.** An *external sort* that places *strings* created by an *internal sort* phase on half of the available *storage devices* and then *merges* strings by moving them back and forth between an equal number of devices until the *merging process* is complete.

**balanced merge sort.** An *external sort* in which the sorted *subsets* created by the *internal sorts* are equally distributed among half of the available *auxiliary storage devices*. The subsets are merged onto the other half of the *auxiliary storage devices* and the process is repeated until all *items* are in one sorted set.

**band.** (1) (ISO) A group of *tracks* on a *magnetic drum* or a *magnetic disk*, all of which are read or written in parallel. (2) In *data communication*, the frequency spectrum between two defined limits.

**band printer.** (ISO) An *impact printer* in which the *character set* available for printing is carried on a flexible band.

**bank.** See *data bank*.

**bar.** See *type bar*.

**bar code.** (ISO) A *code* representing *characters* by sets of parallel bars of varying thickness and separation that are read optically by *transverse scanning*.

**bar printer.** (ISO) An *impact printer* in which the *type slugs* are carried on a *type bar*.

**base.** (1) (ISO) In the *numeration system* commonly used in scientific papers, the *number* that is raised to the power denoted by the *exponent* and then multiplied by the *mantissa* to determine the *real number* represented, for example, the number 6.25 in the expression  $2.7 \times 6.25^{1.5} = 42.1875$ . (2) A reference value. (3) A *number* that is multiplied by itself as many times as indicated by an *exponent*. (4) See *actual information base*, *complement base*, *database*, *floating-point base*, *information base*, *knowledge base*. (5) Contrast with *radix*.

**base address.** (1) (ISO) An *address* that is used as the origin in the calculation of *addresses* in the execution of a *computer program*. (2) A given *address* from which an *absolute address* is derived by combination with a *relative address*.

**base address register.** (ISO) A *register* that holds a *base address*.

**baseband local area network.** (1) (ISO) A *local area network* in which *information* is *encoded*, *multiplexed*, and transmitted without *modulation* of carriers. (2) See also *broadband local area network*.

**base node.** Synonym for *root record*.

**BASIC.** (beginner's all-purpose symbolic instruction code). A procedural *algebraic language* originally designed for ease of learning with a small *instruction repertoire*.

**basic mode link control.** (ISO) Control of *data links* by use of the *control characters* of the 7-bit *character set* for *information processing interchange* as given in ISO Standard 646-1983 and CCITT Recommendation V.3-1972.

**batch entry.** See *remote batch entry*.

**batch processing.** (1) (ISO) The *processing* of *data* or the accomplishment of *jobs* accumulated in advance in such a manner that the *user* cannot further influence the processing while it is in progress. (2) The *proc-*

essing of *data* accumulated over a period of time. (3) Loosely, the execution of *computer programs* serially. (4) Pertaining to the technique of *executing* a set of *computer programs* such that each is completed before the next program of the set is started. (5) Pertaining to the *sequential input* of *computer programs* or *data*. (6) See *remote batch processing*, *sequential batch processing*.

**battery-powered calculator.** (ISO) A *calculator* that depends solely for its power upon a chemical, solar, or rechargeable battery.

**baud.** (1) A unit of signaling speed equal to the number of *discrete* conditions or *signal* events per second. For example, one baud equals one-half dot cycle per second in Morse code, one *bit* per second in a train of *binary* signals, and one 3-bit value per second in a train of signals, each of which can assume one of eight different states. (2) In *asynchronous transmission*, the unit of *modulation rate* corresponding to one unit interval per second, that is, if the duration of the unit interval is 20 milliseconds, the modulation rate is 50 baud.

**BCD.** *Binary-coded decimal.*

**beginning-of-file label.** (ISO) An *internal label* that identifies a *file*, marks its location, and contains *data* for use in file control. Synonymous with header label.

**beginning-of-volume label.** (ISO) An *internal label* that identifies a *volume* and indicates the beginning of recorded *data*. Synonymous with volume header, volume label.

**beginning-of-tape marker.** (ISO) A marker on a *magnetic tape* used to indicate the beginning of the permissible recording area, for example, a photo reflective strip, a transparent section of tape.

**BEL.** The *bell character*.

**bell character (BEL).** (ISO) A *control character* that is used when there is a need to *call* for human attention and that may activate an alarm or other attention device.

**belt printer.** (ISO) An *impact printer* in which the *character set* available for printing is carried on a belt.

**benchmark problem.** (1) A problem used to evaluate the performance of *hardware*, *software*, or both. (2) A problem used to evaluate the performance of several *computers* relative one to another, or a single computer relative to *system* specifications.

**benchmark test.** (ISO) A test that uses a representative set of *programs* and *data* designed to evaluate the performance of *computer hardware* and *software* in a given *configuration*.

**bias.** (1) (ISO) A systematic deviation of a value from a reference value. (2) The amount by which the

average of a set of values departs from a reference value. (3) See *ordering bias*.

**bias error.** (ISO) An error due to *bias*, that is, an error caused by a shrunken measuring tape, or an error caused by *truncation* in a computation.

**bidirectional flow.** (ISO) Flow in either direction represented on the same *flowline* in a *flowchart*.

**bidirectional printer.** (ISO) A *printer* that can print left to right and right to left. Synonymous with reverse printer.

**binary.** (1) (ISO) Pertaining to a selection, choice, or condition that has two possible different values or states. (2) (ISO) Pertaining to a *fixed radix numeration system* that has a *radix* of two. (3) See *column binary*, *row binary*.

**binary arithmetic operation.** (ISO) An *arithmetic operation* in which the *operands* and the result are represented in the *pure binary numeration system*.

**binary card.** A *punched card* containing *data* in *column binary* or *row binary* form.

**binary cell.** (1) (ISO) A *storage cell* that can hold one *binary character*. (2) A *storage cell* of one *binary digit* capacity, for example, a single-bit *register*.

**binary code.** A code that makes use of exactly two distinct *characters*, usually 0 and 1.

**binary-coded decimal code.** Synonym for *binary-coded decimal notation*.

**binary-coded decimal interchange code.** See *extended binary-coded decimal interchange code*.

**binary-coded decimal notation (BCD).** (ISO) A *binary-coded notation* in which each of the *decimal digits* is represented by a *binary numeral*; for example, in a notation that uses the *weights* 8, 4, 2, 1, the number twenty-three is represented by 0010 0011, as compared with its representation as 10111 in the *pure binary numeration system*. Synonymous with *binary-coded decimal code*, *binary-coded decimal representation*.

**binary-coded decimal representation.** (ISO) Synonym for *binary-coded decimal notation*.

**binary-coded notation.** (ISO) A *binary notation* in which each of the *decimal digits* is represented by a *binary numeral*.

**binary digit.** (ISO) In *binary notation*, either of the *characters*, 0 or 1.

**binary element.** (ISO) A constituent element of *data* that takes either of two values or states.

**binary element string.** (ISO) A *string* consisting solely of *binary elements*.

**binary exponential backoff.** (ISO) See *truncated binary exponential backoff*.



**binary notation.** (ISO) Any notation that uses two different *characters*, usually the *binary digits* 0 and 1, for example, the *gray code*. Synonymous with pure binary numeration system.

**binary number.** Loosely, a *binary numeral*.

**binary numeral.** (ISO) A *numeral* in the *pure binary numeration system*; for example, the binary numeral 101 is equivalent to the Roman numeral V.

**binary operator.** (ISO) Synonym for *dyadic operator*.

**binary search.** (ISO) A *dichotomizing search* that processes *sets* of an equal number of *data elements*, or in the case of an odd number of elements in the initial set, allows one set to contain one additional element.

**bind.** (ISO) To associate a *variable* with an *absolute address*, *identifier*, or *virtual address* with a *symbolic address* or *label* in a *computer program*.

**binder-hole card.** A card that contains one or more holes for binding.

**bionics.** A branch of technology that relates the *functions*, characteristics, and phenomena of living systems to the development of mechanical systems.

**biquinary code.** (ISO) A *notation* in which a decimal *digit*  $n$  is represented by the pair of *numerals*  $a$ ,  $b$ , where  $a$  equals 0 or 1,  $b$  equals 0, 1, 2, 3, or 4, and the sum of  $5a + b$  is equal to  $n$ .

**bistable.** Pertaining to a device capable of assuming either one of two stable states.

**bistable trigger circuit.** (ISO) A *trigger circuit* that has two stable states. Synonymous with flip-flop.

**bit.** (1) (ISO) In the *pure binary numeration system*, either of the *digits* 0 and 1. (2) See *check bit*, *information bit*, *parity bit*, *sign bit*.

**bit configuration.** (ISO) The *order* for encoding the *bits* of *information* that define a *character*.

**bit density.** (1) (ISO) A measure of the number of *bits* recorded per unit of length or area. Synonymous with recording density. (2) (ISO) The spacing along a *magnetic medium* of the *bits* that represent *information*.

**bit position.** (ISO) A *character position* in a *word* in a *binary notation*.

**bit string.** (ISO) A *string* that consists solely of *bits*.

**blank.** A part of a *data medium* in which no *characters* are recorded.

**blank character.** A *graphic* representation of the *space character*.

**blanking.** (ISO) The suppression of the *display* of one or more *display elements* or *display segments*.

**blank medium.** (ISO) A *data medium* in or on which neither marks of reference nor *user data* have been recorded. Synonymous with virgin medium.

**blinking.** (ISO) An intentional periodic change in the intensity of one or more *display elements* or *display segments*.

**block.** (1) (ISO) A *string* of *records*, *words*, or *characters* that for technical or logical purposes are treated as a unity. (2) A collection of contiguous *records* that are recorded as a unit, and the units are separated by *interblock gaps*. (3) A group of *bits* or *digits* that are transmitted as a unit and that may be encoded for error-control purposes. (4) In *programming languages*, a subdivision of a *program* that serves to group related *statements*, delimit *routines*, specify *storage allocation*, delineate the applicability of *labels*, or segment parts of the program for other purposes. In *FORTRAN*, a block may be a *sequence* of *statements*; in *COBOL*, it may be a physical record. (5) See *control block*, *program block*.

**block cancel character.** (ISO) A *cancel character* used to indicate that the preceding portion of the *block*, back to the most recently occurring block mark, is to be disregarded. Synonymous with block ignore character.

**block character.** See *end-of-transmission-block character*.

**block check.** (ISO) The part of the *error control procedure* that is used for determining that a *block* of *data* is structured according to given rules.

**block diagram.** (ISO) A diagram of a *system*, a *computer*, or a device in which the principal parts are represented by suitably annotated geometrical figures to show both the basic *functions* of the parts and their functional relationships.

**block ignore character.** (ISO) The *block cancel character*.

**blocking factor.** (ISO) The number of *records* in a *block*; the number is computed by dividing the size of the block by the size of each record contained therein. Synonymous with grouping factor.

**block length.** (1) (ISO) The number of *records*, *words* or *characters* in a *block*. (2) A measure of the size of a *block*, usually specified in units such as *records*, *words*, *computer words*, or *characters*.

**block move.** Synonym for *cut and paste*.

**block structure.** A hierarchy of *program blocks*.

**block transfer.** (ISO) The process, initiated by a single action, of transferring one or more *blocks* of *data*.

**blowback.** In *micrographics*, an enlargement.

**BNF.** (1) *Backus Naur form*. (2) *Backus normal form*.

**BOF.** *Beginning-of-file*.

**boilerplate.** (ISO) A frequently used segment of *stored text* that may be combined with other text to create a new *document*. Synonymous with *stored paragraph*.

**Boolean.** Pertaining to the *processes* used in the algebra formulated by George Boole.

**Boolean add.** Synonym for *OR*.

**Boolean function.** (ISO) A switching *function* in which the number of possible values of the function and each of its independent *variables* is two.

**Boolean operation.** (1) (ISO) Any *operation* in which each of the *operands* and the result take one of two values. (2) (ISO) An *operation* that follows the rules of Boolean algebra. (3) See *dyadic Boolean operation*.

**Boolean operation table.** (ISO) A *table of operations*, each of whose *operands* and the result may have one of two values.

**Boolean operator.** (1) (ISO) An *operator*, each of whose *operands* and whose result take one of two values. (2) See *dyadic operator*, *monadic operator*.

**bootstrap.** (1) (ISO) A *set of instructions* that cause additional instructions to be *loaded* until the complete *computer program* is in *storage*. (2) A technique or device designed to bring itself into a desired state by means of its own action; for example, a machine *routine* whose first few *instructions* are sufficient to bring the rest of itself into the *computer* from an *input device*. (3) That part of a *computer program* that may be used to establish another version of the computer program. (4) (ISO) To use a bootstrap.

**bootstrap loader.** (ISO) An *input routine* in which preset *computer operations* are used to *load* a *bootstrap*.

**borrow.** (1) An arithmetically negative *carry*. (2) See *end-around borrow*.

**borrow digit.** (ISO) A *digit* that is generated when a *difference* in a *digit place* is arithmetically negative and that is *transferred* for *processing* elsewhere. In a *positional representation system*, a borrow digit is transferred to the digit place with the next higher *weight* for *processing* there.

**BOT.** *Beginning-of-tape*.

**bottom-up.** (ISO) Pertaining to a method or procedure that starts at the lowest level of abstraction and proceeds toward the highest level.

**BOV.** *Beginning-of-volume*.

**branch.** (1) (ISO) In a *network*, a *path* that connects two *adjacent nodes* and that has no *intermediate nodes*. (2) A *set of instructions* that are *executed* between two successive branch instructions. (3) A direct path joining two *nodes* of a graph. (4) Loosely, a *conditional jump*. (5) To select a branch as in (2).

**breakpoint.** (1) (ISO) In a *computer program*, a place, usually specified by an *instruction*, where its *execution* may be interrupted by external intervention or by a *monitor program*. (2) (ISO) An *instruction* in a *computer program* for halting *execution*, usually at a position in the program at which a halt may occur, providing a convenient *restart position*.

**breakpoint halt.** (ISO) A *closed loop* that consists of a single *instruction* that effects a *jump* to itself, and that is often used to achieve a *breakpoint*.

**bridge.** (1) (ISO) A *functional unit* that interconnects two *local area networks* that use the same *logical link control procedure*, but may use different *medium access control procedures*. (2) See also *LAN gateway*.

**bridge input circuit.** (ISO) In *process control*, an *analog input circuit* in which the sensing component of the *technical process* is in one branch of the bridge circuit and the reference components are in another branch.

**broadband local area network.** (1) (ISO) A *local area network* in which *information* is *encoded*, *multiplexed*, and transmitted with modulation of carriers. (2) See also *baseband local area network*.

**browse.** (ISO) In *text processing*, the rapid review of *displayed text* by *scrolling*. Synonymous with high-speed scrolling, scan.

**BS.** The *backspace character*.

**bubble sort.** An *exchange sort* in which the sequence of examination of pairs of *items* is reversed whenever an exchange is made. Synonymous with *sifting sort*.

**buffer.** (1) A *routine* or *storage* used to compensate for a difference in rate of flow of *data*, or time of occurrence of events, when transferring data from one device to another. (2) An isolating *circuit* used to prevent a driven circuit from influencing the driving circuit. (3) To allocate and schedule the use of *buffers*.

**buffering.** See *anticipatory buffering*, *dynamic buffering*, *simple buffering*.

**buffer storage.** (1) (ISO) A *storage device* that is used to compensate for differences in the rate of flow of *data* between components of a *data processing system*, or for the time of occurrence of events in the components. (2) (ISO) In *text processing*, a temporary area in *memory* in which *text* is held.

**bug.** A *mistake* or *malfunction*.

**built-in check.** Synonym for *automatic check*.

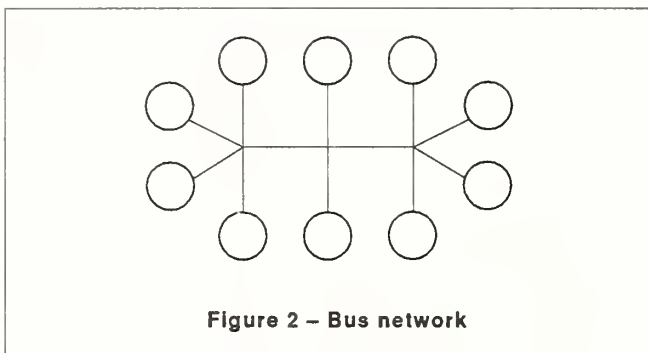
**burst.** (1) In *data communication*, a *sequence of signals* counted as one unit in accordance with some specific criterion or measure. (2) To separate *continuous-forms* paper into discrete sheets. (3) See *error burst*.



**burst transmission.** (ISO) *Data transmission at a specific data signalling rate during controlled intermittent intervals.*

**bus.** (1) One or more conductors used for transmitting signals or power. (2) See *control bus*, *data bus*.

**bus network.** (1) (ISO) A *local area network* in which there is only one *path* between any two *data stations* and in which *data* transmitted by any station is concurrently available to all other stations on the same *transmission medium*. A bus network may be a *multipoint network*, a *star network*, or a *tree network*. In the case of a tree or star network, there is a data station at each *endpoint node*. There is no data station at an *intermediate node*; however, one or more devices such as *repeaters*, *connectors*, *amplifiers*, and *splitters* are located there. (2) See Figure 2.



**Figure 2 – Bus network**

**byte.** (1) (ISO) A *binary character string* operated upon as a unit and usually shorter than a *computer word*. (2) See *n-bit byte*.



## C

**C.** A general-purpose *high-level programming language*, especially suited for systems programming, as well as for *application programming*; its features support and emphasize *structured programming*, *data structures* with *weak typing*, *pointers*, and *address manipulation*, *recursive functions* and *bit and character manipulation*.

**cache memory.** (ISO) A special *buffer storage*, smaller and faster than *main storage*, that is used to hold a *copy of instructions* and *data* in *main storage* that are likely to be needed next by the *processor*, and that have been obtained *automatically* from *main storage*.

**calculating machine.** (1) A machine that performs the arithmetic functions of a *calculator*, principally by electromechanical means; the predecessor to the calculator. (2) See *nonprinting calculating machine*, *printing calculating machine*.

**calculating punch.** (ISO) A *calculator* with a *card reader* and a *card punch* that reads the data on a *punched card*, performs some *arithmetic operations* or *logic operations* on the data, and punches the results on the same or another punched card.

**calculator.** (1) (ISO) A device that is especially suitable for performing *arithmetic operations*, but that requires human intervention to alter its *stored program*, if any, and to initiate each *operation* or *sequence of operations*. A calculator performs some of the *functions* of a *computer* but does not usually operate without frequent human intervention. (2) See *desktop calculator*, *display and printing calculator*, *display calculator*, *hand-held calculator*, *line/battery-powered calculator*, *line-powered calculator*, *nonprogrammable calculator*, *pocket calculator*, *printing calculator*, *programmable calculator*.

**calculator with algebraic logic.** (ISO) A *calculator* in which the internal circuitry requires that after the *input* of the first *operand*, the *operating symbol* be given before the input of each subsequent operand for addi-

tion and subtraction operations. When combining addition and subtraction with multiplication and division, the *user* is not required to take interim results; for example, the *sequence* of operations used in a calculator with algebraic entry to solve the problem: (see Figure 3).

$\frac{12 + 3 - 5}{2} = 5$		
Key	Display	Print
12 [+]	12 12	12 +
3 [-]	3 15	3 -
5 [÷]	5 10	5 ÷
2 [=]	2 5	2 = 5 *

Figure 3 – Calculator with algebraic logic

**calculator with arithmetic logic.** (ISO) A *calculator* in which the internal circuitry requires that the *operating symbol* be given after the *input* of each *operand* for addition and subtraction operations. When combining addition and subtraction with multiplication and division, the *user* must take interim results; for example, the *sequence* of operations used in a calculator to solve the problem: (see Figure 4).

$\frac{12 + 3 - 5}{2} = 5$		
Key	Display	Print
12 [+]	12 12	12 +
3 [+]	3 15	3 +
5 [-]	5 10	5 -
[÷]	10	10 ÷
2 [÷]	2 5	2 = 5 *

Figure 4 – Calculator with arithmetic logic

**calculator with external program input.** (ISO) A *calculator* that allows a given number of *program* steps to be entered from an external *data medium* and to be retained in the calculator for repeated use.

**calculator with keyboard and external program input.** (ISO) A *calculator* that allows a given number of *program* steps to be entered either via the *keyboard* or from an external *data medium* and to be retained in the calculator for repeated use.

**calculator with keyboard-controlled addressable storage.** (ISO) A *calculator* that allows only *keyboard-controlled storage* and accumulation of *data*; the data in storage is changed only by *keyboard operations* addressed to those devices.

**calculator with keyboard program input.** (ISO) A *calculator* that allows a given number of *program* steps to be entered via the *keyboard* and retained in the calculator for repeated use.

**calculator without addressable storage.** (ISO) A *calculator* in which *data* cannot be stored without being cleared by subsequent *operations*, but that may or may not have a facility for storing *constants*.

**calculator with postfix notation.** (ISO) A *calculator* in which the internal circuitry allows the first *operand* to be entered without operating *symbols* by means of an enter *key* and the subsequent operands, followed by the operating *symbols*. When combining addition and subtraction with multiplication and division, the user is not required to take interim results; for example, the sequence of *operations* used in a calculator with *postfix notation* logic entry to solve the problem is: (see Figure 5).

$\frac{12 + 3 - 5}{2} = 5$		
Key	Display	Print
12	12	12 #
ENTER	12	
3	3	3 +
+	15	
5	5	5 -
-	10	
2	2	2 ÷
÷	5	
		5 *

Figure 5 – Calculator with postfix notation

**calculator with program-controlled addressable storage.** (ISO) A *calculator* that allows only *program-controlled storage*, *keyboard-controlled storage*, and accumulation of *data*; the data in storage are changed only by *program* steps addressed to those devices.

**calculator with program-controlled and keyboard-controlled addressable storage.** (ISO) A *calculator* that allows both *program-controlled* and *keyboard-controlled storage* and accumulation of *data*; the data in storage are changed only by subsequent *operations* addressed to those devices.

**calculus.** See *relational calculus*.

**calculus of variations.** The theory of maxima and minima of definite integrals whose integrand is a *function* of the dependent *variables*, the independent *variables* and their derivatives.

**call.** (1) (ISO) The action of bringing a *computer program*, a *routine* or a *subroutine* into effect, usually by specifying the entry conditions and jumping to an *entry point*. (2) In *data communication*, the action performed by the *calling party*, or the *operations* necessary in making a *call*, or the effective use made of a *connection* between two stations. (3) (ISO) In *computer programming*, to *execute a call*. (4) To transfer control to a specified *closed subroutine*.

**call accepted signal.** (ISO) A *call control signal* that is sent by the called *data terminal equipment* to indicate that it accepts the incoming call.

**call control procedure.** (ISO) The implementation of a set of *protocols* necessary to establish and release a *call*.

**calligraphic display device.** (ISO) A *display device* in which the *display elements* of a *display image* may be generated in any *program-controlled sequence*. Synonymous with directed-beam display device.

**calling.** (1) (ISO) The process of transmitting selection *signals* in order to establish a *connection* between *data stations*. (2) See *automatic calling*, *manual calling*.

**calling sequence.** (ISO) A *sequence of instructions* together with any associated *data* necessary to perform *call*.

**call not accepted signal.** (ISO) A *call control signal* sent by the called *data terminal equipment* to indicate that it does not accept the incoming call.

**CAN.** The *cancel character*.

**cancel character (CAN).** (1) A *control character* used by some convention to indicate that the *data* with which it is associated are in error or are to be disregarded. Synonymous with ignore character. (2) An *accuracy control character* used to indicate that the *data* with which it is associated are in error, are to be disregarded, or cannot be represented on a particular device. (3) See *block cancel character*.

**capacitor storage.** (ISO) A *storage device* that uses the capacitive properties of certain materials.

**capacity.** See *storage capacity*.



**card.** See *aperture card, binary card, binder-hole card, check card, credit card, debit card, edge-coated card, flash card, header card, Hollerith card, laced card, magnetic card, mark-sensing card, punch card, punched card, scored card, source data card, stub card, trailer card.*

**card column.** (1) (ISO) A line of *punch positions* parallel to the shorter edge of a *punch card*. (2) A line of *punch positions* parallel to the *Y-datum line* of a *punch card*.

**card deck.** (ISO) A group of *punched cards*.

**card duplicator.** (ISO) Synonym for *card reproducing punch*.

**card feed.** (ISO) The mechanism that moves cards from the *card hopper* to the *card path*.

**card field.** A specific combination of *punch positions, mark-sensing positions, or both, on a card.*

**card form.** See *printed card form*.

**card hopper.** (ISO) The part of a *card-processing device* that holds the cards to be processed and makes them available to a *card feed mechanism*.

**card image.** A one-to-one representation of the *hole patterns* of a *punched card*; for example, a matrix in which a one represents a punch and a zero represents the absence of a punch.

**cardinality.** The number of *tuples* in a *relation*.

**card jam.** A malfunction of a *card-processing device* that causes cards to become jammed.

**card path.** (ISO) In a *card-processing device*, the path along which cards are moved and guided.

**card punch.** (ISO) An *output unit* that produces a record of *data* in the form of *hole patterns* in *punched cards*.

**card reader.** (1) (ISO) An *input unit* that reads or senses the holes in a *punched card*, transforming the *data* from *hole patterns* to *electrical signals*. (2) An *input device* that senses *hole patterns* in a *punched card* and translates them into *machine language*. Synonymous with *punched card reader*.

**card reproducer.** (ISO) Synonym for *card reproducing punch*.

**card reproducing punch.** (ISO) A *punched-card device* that prepares one punched card from another punched card, copying all or part of the *data* from the punched card that is read. Synonymous with *card duplicator, card reproducer*.

**card row.** (1) (ISO) A line of *punch positions* parallel to the longer edge of a *punch card*. (2) A line of *punch positions* parallel to the *X-datum line* of a *punch card*.

**card stacker.** (ISO) The part of a *card-processing device* that receives the cards after they have been processed.

**card storage.** See *magnetic card storage*.

**card track.** The part of a *card-processing device* that moves and guides the card through the device.

**carriage.** See *automatic carriage*.

**carriage control tape.** (1) A tape that is used to control vertical tabulation of *printing positions or display positions*. (2) A tape that contains *line feed control data* for a printing device.

**carriage return (CR).** (1) (ISO) The movement of the *printing position or display position* to the first position on the same line. (2) The operation that prepares for the next character to be printed or displayed at the first position on the same line.

**carriage return character.** A *format effector* that causes the *printing position or display position* to move to the first position on the same line.

**carrier sense.** (ISO) In a *local area network*, an ongoing activity of a *data station* to detect whether another station is transmitting.

**carrier sense multiple access with collision avoidance (CSMA/CA).** (ISO) A *protocol* that requires *carrier sense* and in which a *data station* that intends to transmit sends a *jam signal*; after waiting a sufficient time for all stations to pick up the jam signal, it sends a *transmission frame*; if while transmitting it detects another station's jam signal, it stops transmitting for a designated time and then tries again.

**carrier sense multiple access with collision detection (CSMA/CD).** (ISO) A *protocol* that requires *carrier sense* and in which a transmitting *data station* that detects another *signal* while transmitting, stops sending, sends a *jam signal*, and then waits for a variable time before trying again.

**carry.** (1) (ISO) The action of transferring a *carry digit*. (2) (ISO) To transfer a *carry digit*. (3) One or more *digits*, produced in connection with an *arithmetic operation* on one *digit place* of two or more *numerals* in positional notation, that are forwarded to another digit place for processing there. (4) The *number* represented by the *digit or digits* in (3). (5) Most commonly, a *digit* as defined in (3), that arises when the sum or product of two or more digits equals or exceeds the *radix* of the *number representation system*. (6) Less commonly, a *borrow*. (7) The *command* directing that a carry be forwarded. (8) See *cascaded carry, complete carry, end-around carry, high-speed carry, partial carry, standing-on-nines carry*.

**carry digit.** (ISO) A *digit* that is generated when a sum or a product in a *digit place* exceeds the largest

**number** that can be represented in that digit place and that is transferred for processing elsewhere. In a *positional representation system*, a carry digit is transferred to the digit place with the next higher weight for processing there.

**cartridge.** See *magnetic tape cartridge*.

**cascaded carry.** (ISO) In *parallel addition*, a procedure in which the addition results in a partial sum numeral and a carry numeral which are, in turn, added; this process is repeated until a zero carry is generated.

**cash register.** A device that usually has means for entering and accumulating and exhibiting or recording financial data at the time of a transaction and which includes means for protection. A cash register has a money receptacle or means for printing a bill, or both.

**cassette.** See *magnetic tape cassette*.

**catalog.** (1) A *directory of files and libraries*, with references to their locations. A catalog may contain other information such as passwords, blocking factors, and the types of devices on which the files are stored. (2) (ISO) To enter information about a file or library into a catalog.

**cathode ray storage.** (ISO) An *electrostatic storage* that uses a cathode ray beam for access to data.

**cathode ray tube display.** A device that presents data in visual form by means of controlled electron beams.

**cell.** See *binary cell, magnetic cell, storage cell*.

**central processing unit.** Deprecated term for *processing unit*.

**certification.** In *computer systems*, a technical evaluation, made as part of and in support of the accreditation process, that establishes the extent to which a particular computer system or network design and implementation meet a prespecified set of requirements.

**chad.** The material separated from a data medium when punching a hole.

**chadless tape.** *Punched tape* that has been punched in such a way that chad is not formed.

**chain.** See *daisy chain, Markov chain*.

**chain code.** An arrangement in a cyclic sequence of some or all of the possible different *n-bit* words, in which adjacent words are related in such a manner that each word is derivable from its neighbor by displacing the bits one digit position to the left or right, dropping the leading bit, and inserting a bit at the end. The value of the inserted bit needs only to meet the requirement that a word must not recur before the cycle is complete.

**chained list.** (ISO) A list in which the data items may be dispersed, but in which each item contains an identifier for locating the next item. Synonymous with linked list.

**chained list search.** (ISO) A search that uses a chained list. Synonymous with linked list search.

**chain printer.** (ISO) An *impact printer* in which the type slugs are carried by the links of a revolving chain.

**change.** (ISO) A function or mode that enables a user to modify a specified character string in previously entered text.

**change character.** See *font change character*.

**change dump.** (ISO) The dumping of those storage locations whose contents have been changed during a specified period.

**changeover system.** (ISO) A temporary information processing system used to facilitate the transition from an operational system to its successor at a given moment.

**channel.** (1) (ISO) A means of one-way transmission. A channel may be provided, for example, by frequency or time division multiplexing. Synonymous with data transmission channel. (2) A path along which signals may be sent; for example, an output channel. (3) The portion of a storage medium that is accessible to a given reading or writing station, such as a track, or a band. (4) See *backward channel, forward channel*.

**character.** (1) (ISO) A member of a set of elements that is used for the organization, control, or representation of information; the elements may be letters, digits, punctuation marks, or other symbols. (2) See *accuracy control character, acknowledge character, backspace character, bell character, blank character, block cancel character, cancel character, carriage return character, check character, code extension character, control character, cyclic-redundancy check character, data link escape character, debossed character, delete character, device control character, embossed character, end-of-medium character, end-of-text character, end-of-transmission block character, end-of-transmission character, enquiry character, escape character, filler character, font change character, form feed character, gap character, graphic character, group separator character, illegal character, line feed character, new-line character, null character, print control character, record separator character, redundancy-check character, shift-in character, shift-out character, sign character, space character, special character, start-of-heading character, start-of-text character, substitute character, synchronous idle character*.

**character boundary.** In *character recognition*, the largest rectangle, with a side parallel to the document



*reference edge*, each of whose sides is tangential to a given *character outline*.

**character box.** (ISO) An imaginary rectangular area that includes all parts of a *character* and that is used to determine the size, orientation, and spacing between characters.

**character check.** A *check* that verifies the observance of rules for the formation of *characters*.

**character display device.** (ISO) A *display device* that provides representation of *data* only in the form of *characters*.

**character fill.** To *insert* as often as necessary into a *storage* medium the representation of a specified *character* that does not itself convey *data* but may delete unwanted *data*.

**character generator.** (1) (ISO) A *functional unit* that converts the *coded representation* of a *character* into the *graphic representation* of the *character* for *display*. (2) See *dot matrix character generator*, *stroke character generator*.

**character insert.** (ISO) The placement of a *character* between two other *characters*, in such a manner that the *text* is *automatically* rearranged to accept the addition.

**characteristic.** (1) (ISO) In a *floating-point representation*, the *numeral* that represents the *exponent*. (2) (ISO) The integer part, which may be positive or negative, of the representation of a logarithm.

**character outline.** The *graphic pattern* established by the *stroke edges* of a *character*.

**character printer.** (1) (ISO) A *printer* that prints a single *character* at a time. (2) Synonymous with *serial printer*.

**character reader.** (ISO) An *input unit* that performs *character recognition*.

**character recognition.** (1) (ISO) The identification of *characters* by *automatic means*. (2) See *magnetic ink character recognition*, *optical character recognition*, *pattern recognition*.

**character set.** (1) (ISO) A finite *set* of different *characters* that is complete for a given purpose. (2) An *ordered set* of unique representations called *characters*, such as the 26 *letters* of the English *alphabet*, Boolean 0 and 1, the set of *symbols* in the Morse code, and the 128 ASCII characters. (3) See *alphabetic character set*, *coded character set*, *numeric character set*, *numeric coded character set*.

**character spacing reference line.** In *character recognition*, a vertical line that is used to evaluate the horizontal spacing of *characters*. It may be a line that equally divides the distance between the sides of a

*character boundary* or that coincides with the centerline of a vertical stroke.

**character string.** (ISO) A *string* that consists solely of *characters*.

**check.** (1) A process for determining *accuracy*. (2) See *automatic check*, *character check*, *completeness check*, *cyclic redundancy check*, *duplication check*, *echo check*, *expiration check*, *format check*, *limit check*, *longitudinal parity check*, *mathematical check*, *modulo-N check*, *overflow check*, *parity check*, *range check*, *reasonableness check*, *redundancy check*, *sequence check*, *summation check*, *transverse parity check*.

**check bit.** (1) A *binary check digit*, for example, a *parity bit*. (2) See *redundancy check bit*.

**check card.** (1) A *punched card* suitable for use as a bank check. (2) A *punch card* used for checking.

**check character.** (1) (ISO) A *check key* that consists of a single *character*. (2) A *character* that is used for the purpose of performing a *check*. (3) See *cyclic redundancy-check character*.

**check digit.** (ISO) A *check key* that consists of a single *digit*.

**checking program.** A *program* that examines other programs or sets of *data* for *mistakes* of *syntax* and *semantics*.

**check key.** (ISO) One or more *characters*, derived from and appended to a *data item*, that can be used to detect errors in the *data item*.

**checkout.** Synonym for *debug*.

**checkpoint.** (1) A specified point in time or in the course of a *processing activity* at which a record is made of the state of a *system* including the *transactions* in process at that particular point. (2) A *sequence of instructions* in a *program* for recording the status of *execution* for *restart purposes*.

**checkpoint dump.** A *dump* of the entire contents of *main storage* and *registers*, taken at a *checkpoint*.

**check problem.** (ISO) A problem with a known solution used to determine whether a *functional unit* is operating properly.

**checksum.** (ISO) The sum of a group of *data items* that is stored with the group and is used for checking purposes; the *data items* are either *numeric* or may be treated as *numeric* for purposes of calculating the checksum.

**Chinese binary.** Synonym for *column binary*.

**chip.** (1) A minute piece of semiconductive material used in the manufacture of electronic components. (2) An integrated circuit on a piece of semiconductive material. (3) In *micrographics*, a piece of *microfilm*.



that is smaller than a *microfiche* and that contains *microimages* and coded identification.

**choice device.** (ISO) An *input device* that provides a choice of one of a set of alternatives; for example, a *function keyboard*.

**cine-oriented image.** In *micrographics*, an image appearing on a roll of *microfilm* in such a manner that the top edge of the image is perpendicular to the long edge of the film.

**circuit.** (1) In *data communication*, a means of two-way communication between two *data terminal installations*. (2) A path of electrical, optical, or logic elements and interconnecting conductors that can perform one or more *functions*. (3) See *combinational circuit*, *monostable trigger circuit*, *sequential circuit*, *trigger circuit*.

**circuit switching.** (ISO) A *process* that, on demand, connects two or more *data terminal equipments* and permits the exclusive use of a *data circuit* between them until the *connection* is released.

**circular shift.** Synonym for *end-around shift*.

**circulating register.** A *shift register* in which *data* moved out of one end of the register are reentered into the other end, as in a *closed loop*.

**circulating storage.** *Dynamic storage* involving a *closed loop*. Synonymous with *cyclic storage*.

**class (of entities).** In a *conceptual schema language*, all possible *entities* in the *universe of discourse* for which a given *proposition* holds.

**clear.** (ISO) To cause one or more *storage locations* to be in a prescribed state, usually that corresponding to zero or that corresponding to the *space character*.

**clear-all function.** (ISO) In a *calculator*, the *function* that cancels *data* in the working registers and in *storage*.

**clear area.** In *character recognition*, a specified area that is to be kept free of printing or any other markings not related to *machine reading*.

**clear entry function.** (ISO) In a *calculator*, the *function* that cancels *data* entered but not yet processed.

**clear memory function.** (ISO) In a *calculator*, the *function* that cancels *data* in *storage*; other keys on the calculator may be used for canceling specified functions.

**clipping.** (ISO) The removal of those parts of *display elements* that lie outside of a given boundary.

**clock.** (1) (ISO) A device that generates periodic, accurately spaced *signals* used for such purposes as timing, regulation of the operations of a processor, or generation of *interrupts*. (2) See *master clock*.

**clocking bits.** (ISO) Magnetically encoded *signals*, usually zeros, that precede the *data* and that are used for establishing timing intervals on an *identification card*.

**clock pulse.** (ISO) Synonym for *clock signal*.

**clock register.** (ISO) Synonym for *timer*.

**clock signal.** (ISO) A periodic *signal* used for synchronization. Synonymous with *clock pulse*.

**clock track.** (ISO) A *track* on which a pattern of *signals* is recorded to provide a timing reference.

**closed loop.** A *loop* whose execution can be interrupted only by intervention from outside the *program* in which the loop is included.

**closed shop.** Pertaining to the operation of a computer facility in which most productive *programming* is performed by a group of programming specialists rather than the problem originators. The use of the computer itself may also be described as closed shop if full-time trained operators, rather than users or programmers, serve as the operators.

**closed subroutine.** A *subroutine*, that needs only to be linked by a *call* for use at more than one place in a *computer program*.

**closed system.** A *system* whose characteristics comply with proprietary standards and that therefore cannot be readily connected with other systems. Contrast with *open system*.

**closed user group.** (ISO) A group of specified users of a *data network* that is assigned a facility that permits them to communicate with each other, but precludes communication with all other users of the service or services. A user *data terminal equipment* may belong to more than one closed user group.

**closed user group with outgoing access.** (ISO) A *closed user group* that has a user-assigned facility which enables that user to communicate with other users of a *data network transmission* service where appropriate, with users having a *data terminal equipment* connected to any other switched network to which interworking facilities are available, or both.

**coalesce.** (1) To combine two or more sets of items into one set of any form. (2) To combine two or more files into one file.

**coated card.** See *edge-coated card*.

**COBOL.** (*Common business oriented language*), a programming language designed for business data processing.

**CODASYL.** Conference on data systems languages.

**CODASYL model.** In a *database management system*, a *network model* whose pattern of organization is

based on *set types* that specify *associations* among *record types*.

**code.** (1) (ISO) A set of rules that *maps* the elements of one set, the *coded set*, onto the elements of another set, the *code element set*. Synonymous with *coding scheme*. (2) A set of *items*, such as *abbreviations*, that represent the members of another set. (3) (ISO) To represent *data* or a *computer program* in a symbolic form that can be accepted by a *processor*. (4) To *write a routine*. (5) See *alphabetic code*, *alphanumeric code*, *binary code*, *biquinary code*, *chain code*, *computer instruction code*, *data code*, *dependent code*, *error correcting code*, *error detecting code*, *excess-three code*, *gray code*, *hamming code*, *interpretive code*, *minimum distance code*, *numeric code*, *object code*, *operation code*, *perforated tape code*, *pseudo code*, *retrieval code*, *return code*, *skeletal code*, *two-out-of-five code*.

**code area.** In *computer micrographics*, that part of a *microform* that is reserved for *retrieval keys*.

**code converter.** (ISO) A *functional unit* that changes the representation of *data* by using one code in the place of another, or one *coded character set* in the place of another.

**coded character set.** (1) (ISO) A *coded set* whose elements are single *characters*; for example, all the *letters* of an *alphabet*. (2) See *alphabetic coded character set*, *alphanumeric coded character set*, *numeric coded character set*.

**coded image.** (ISO) A representation of a *display image* in a form suitable for *storage* and *processing*.

**coded set.** (ISO) A set of elements onto which another set of elements has been mapped according to a *code*; for example, the list of names of airports which is mapped onto a corresponding set of three-letter representations of airport names.

**code element.** (ISO) The result of applying a *code* to an element in a *coded set*, for example, CDG as the representation of a Paris airport in the code for three-letter representation of airport names. Synonymous with *code value*.

**code extension character.** (ISO) Any *control character* used to indicate that one or more of the succeeding coded representations are to be interpreted according to a different *code*, or according to a different *coded character set*.

**code-independent data communication.** (ISO) A mode of *data communication* that uses a *character-oriented protocol* that does not depend on the *character set* or the *code* used by the *data source*.

**code line index.** In *micrographics*, a visual index that consists of an optical pattern of clear and opaque bars

parallel to the long edge of roll *microfilm* and located between images.

**coder.** A person who *writes* but does not usually design *computer programs*.

**code position.** (ISO) Synonym for *punch position*.

**code set.** (ISO) The result of applying a *code* to all elements of a *coded set*; for example, all of the three-letter international representations for airport names.

**code-transparent data communication.** (ISO) A mode of *data communication* that uses a *bit-oriented protocol* that does not depend on the *bit sequence structure* used by the *data source*.

**code value.** (ISO) Synonym for *code element*.

**coding.** See *absolute coding*, *relative coding*, *straight line coding*, *symbolic coding*.

**coding scheme.** (ISO) Synonym for *code* (1).

**coefficient unit.** A *functional unit* whose *output analog variable* is equal to the *input analog variable* multiplied by a constant.

**coexistence model.** A user's logical view of a *database* that allows different *subschemas* to exist at the same time.

**coincident-current selection.** (ISO) In any array of *magnetic storage cells*, the selective switching of one cell in the array by the simultaneous application of two or more currents such that the resultant magnetomotive force exceeds a threshold value only in the selected cell.

**collate.** (ISO) To arrange two or more sets of *data* into a single set according to a predetermined *order*.

**collating sequence.** (1) (ISO) A specified arrangement used in sequencing. (2) An *order* assigned to a set of *items* such that any two sets in that assigned order can be *collated*. (3) Synonym for *sequence* (1).

**collator.** (ISO) A device that *collates*, *merges*, or *matches* sets of *punched cards* or other documents.

**collection station.** See *data input station*.

**color.** In *optical character recognition*, the spectral appearance of the image dependent upon the spectral reflectance of the image, the spectral response of the observer, and the spectral composition of incident light.

**collision.** (ISO) An unwanted condition that arises from *concurrent transmissions* on a *channel* and that results in garbled *data*.

**collision enforcement.** (ISO) In a *carrier sense multiple access/collision detection network*, the continuation of *transmission* by a *data station* that has detected a *collision* to ensure that all other data stations



become aware of the collision. The *signal* sent during the continuation is a *jam signal*.

**column.** (1) A vertical arrangement of *characters* or other expressions. (2) See *card column*, *mark-sensing column*, *punch column*.

**column binary.** Pertaining to the *binary* representation of *data* on cards in which the weights of *punch positions* are assigned along *card columns*; for example, each column in a 12-row card may be used to represent 12 *consecutive bits*. Synonymous with Chinese binary.

**column split.** The capability of a *punch card* device to read or *punch* two parts of a *card column* independently.

**COM.** *Computer output microfilming*.

**COM device.** *Computer output microfilmer*.

**combination.** (1) (ISO) A given number of different elements selected from a set without regard to the order in which the selected elements are arranged. (2) See *forbidden combination*.

**combinational circuit.** (ISO) A *logic device* whose output values, at any given instant, depend only upon the input values at that time. A combinational circuit is a special case of a *sequential circuit* that does not have a *storage capability*.

**combinational gate.** (ISO) A device having at least one *output channel* and zero or more *input channels*, all characterized by *discrete states*, such that at any instant the state of each output channel is completely determined by the states of the input channels at the same instant.

**combined station.** (ISO) In high level *data link* control, the part of a *data station* that supports the combined control *functions* of the data link and that generates *commands* and responses for *transmission* and interprets received commands and responses. Specific responsibilities assigned to a combined station include initialization of control *signal* interchange, organization of *data flow*, interpretation of received commands, and generation of appropriate responses and actions regarding *error control* and *error recovery functions* at the data link level.

**comic-strip oriented image.** In *micrographics*, an image appearing on roll *microfilm* in such a manner that the top edge of the image is parallel to the long edge of the film.

**command.** (1) An order for an action to take place. (2) A control *signal*. (3) In a *conceptual schema language*, the order or trigger for an *action* or *permissible action* to take place. (4) Loosely, a mathematical or *logic operator*. (5) Synonymous with order. (6) See *absolute command*, *display command*, *elementary*

*command*, *embedded command*, *modification command*, *relative command*, *retrieval command*.

**command condition.** In a *conceptual schema language*, the precondition, including synchronization aspects, that must be met before a *permissible action* may take place.

**command key.** In *text processing*, a key that causes a machine *function* to be performed; for example, a *cursor key*.

**command language.** (ISO) A set of procedural operators with a related *syntax* that is used to indicate the *functions* to be performed by an *operating system*. Synonymous with control language.

**command statement.** In a *conceptual schema language*, a *linguistic object* that expresses a *command* or *elementary command*.

**comment.** (ISO) In *programming languages*, a *language construct* that allows text to be inserted into a *program* and that does not have any effect on the execution of the program.

**common field.** A *field* that can be accessed by two or more independent *routines*.

**common mode rejection.** (ISO) The capability of a *differential amplifier* to suppress the effects of the *common mode voltage*.

**common mode voltage.** (1) (ISO) In a *differential amplifier*, the unwanted part of the voltage between each *input connection point* and ground that is added to the voltage of each original *signal*. (2) See *maximum common mode voltage*, *maximum operating common mode voltage*.

**communicating text processor.** (ISO) A *functional unit* that can transmit and receive *information*.

**communication.** See *data communication*.

**communication control character.** Synonym for *transmission control character*.

**communication theory.** (ISO) The mathematical discipline dealing with the probabilistic features of the *transmission of messages* in the presence of *noise* and any other disturbances.

**compact.** (ISO) Synonym for *compress*.

**comparator.** (1) (ISO) In *analog computing*, a *functional unit* that compares two analog *variables* and indicates the result of that comparison. (2) (ISO) A device that compares two items of *data* and indicates the result of that comparison. (3) A device for determining the dissimilarity of two items, such as two *pulse patterns* or *words*.

**compare.** (ISO) To examine two items to discover their relative magnitudes, their relative positions in an



order or in a sequence, or whether they are identical in given characteristics.

**comparison.** (1) The process of examining two or more items for identity, similarity, equality, relative magnitude, or for order in a sequence. (2) See *logical comparison*.

**compatibility.** The capability of a functional unit to meet the requirements of a specified interface.

**compilation.** See *independent compilation, separate compilation*.

**compilation time.** (1) The time at which compilation occurs. (2) The elapsed time taken for the execution of a compiler. (3) Synonymous with compile time.

**compilation unit.** (ISO) A portion of a computer program sufficiently complete to be compiled correctly.

**compile.** (1) (ISO) To translate a computer program expressed in a high-level language into a program expressed in an intermediate language, assembly language, or a machine language. (2) To prepare a machine language program from a computer program written in another programming language by making use of the overall logic structure of the program, or by generating more than one computer instruction for each symbolic statement, or both, as well as performing the function of an assembler.

**compile-and-go.** An operating technique in which there are no stops between the compiling, loading, and execution of a computer program.

**compile phase.** The logical subdivision of a run that includes the execution of a compiler.

**compiler.** (1) (ISO) A computer program for compiling. Synonymous with compiling program. (2) See *incremental compiler*.

**compiler directive.** A language construct that prescribes the action to be taken during compilation for a given set of conditions.

**compiler generator.** A translator or an interpreter that is used to construct compilers.

**compile time.** Synonym for *compilation time*.

**compiling program.** (ISO) Synonym for *compiler*.

**complement.** (1) (ISO) In a fixed-radix numeration system, a numeral that can be derived from a given numeral by operations or events that include subtracting each digit of the digital representation of the given number from the corresponding digit of the digital representation of a specified number. (2) A number that can be derived from a specified number by subtracting it from a second specified number; for example, in a radix numeration system, the second specified number may be a given power of the radix or

one less than the given power of the radix. The negative of a number is often represented by its complement. (3) See *diminished radix complement, nines complement, ones complement, radix complement, tens complement, twos complement*.

**complementary operation.** A Boolean operation whose result is the negation of the result of another Boolean operation on the same operands; for example, *disjunction* is the complementary operation of *nondisjunction*.

**complementary operator.** The logic operator whose result is the NOT of a given logic operator.

**complement base.** (ISO) In a fixed-radix numeration system, the specified number whose digital representation contains the digits from which the corresponding digits of the given number are subtracted in obtaining a complement of the given number.

**complementer.** (ISO) A device whose output data are a representation of the complements of the numbers represented by its input data.

**complement-on-nine.** (ISO) Synonym for *nines complement*.

**complement-on-one.** (ISO) Synonym for *ones complement*.

**complement-on-ten.** (ISO) Synonym for *tens complement*.

**complete carry.** (ISO) In parallel addition, a procedure in which each of the carries is immediately transferred.

**completeness check.** (ISO) A check to determine whether data are present where data are required.

**complex number.** (ISO) A number consisting of an ordered pair of real numbers, expressible in the form  $a + bi$ , where  $a$  and  $b$  are the real numbers and  $i$  squared equals minus 1.

**component.** See *solid state component*.

**composite data element.** Synonym for *data aggregate*.

**compound statement.** (ISO) In programming languages, a sequence of statements so delimited as to be the syntactic equivalent of a single statement.

**compress.** (ISO) To reduce the space taken on a data medium by encoding or removing repetitive characters. Synonymous with *compact*.

**COM printer.** (ISO) A page printer that produces on a photographic film a microimage of each page. Synonymous with *computer output microfilm printer*.

**computational stability.** The degree to which a computational process remains valid when subjected to effects such as errors, mistakes, or malfunctions.

**compute mode.** (ISO) The operating mode of an *analog computer* during which the solution is in progress. Synonymous with *operate mode*.

**computer.** (1) A device that consists of one or more associated *processing units* and *peripheral units*, that is controlled by internally stored *programs*, and that can perform substantial computations, including numerous *arithmetic operations*, or *logic operations*, without human intervention during a *run*. A computer may be a standalone unit or it may consist of several interconnected units. (2) See *analog computer*, *digital computer*, *general-purpose computer*, *host computer*, *hybrid computer*, *incremental computer*, *parallel computer*, *personal computer*, *self-adapting computer*, *sequential computer*, *serial computer*.

**computer-aided publishing.** The use of a *computer* to produce *documents* of typeset quality, including *text*, *graphics*, and *pictures*. In some instances, computer-aided publishing is accomplished through the use of software packages and in other instances it is achieved through the use of a dedicated system. Synonymous with *computer-assisted publishing*, *electronic publishing*.

**computer architecture.** The organizational structure of a *computer system*, including *hardware* and *software*.

**computer-assisted publishing.** Synonym for *computer-aided publishing*.

**computer center.** A facility that includes people, *hardware*, and *software*, organized to provide *information processing services*. Synonymous with *data processing center*, *installation*.

**computer crime.** A crime committed through the use of *software* or *data* residing in a *computer*.

**computer fraud.** Deception by means of a *computer*, deliberately practiced in order to secure unfair or unlawful gain.

**computer-dependent language.** Synonym for *assembly language*.

**computer graphics.** (1) (ISO) Methods and techniques for converting *data* to or from *graphic displays* via *computers*. (2) That branch of science and technology that is concerned with methods and techniques for converting *data* to or from visual presentation, using *computers*.

**computer instruction code.** A code that is used to represent the *instructions* in an *instruction set*. Synonymous with *machine code*.

**computer instruction set.** A complete set of the *operators* of the *instructions* of a *computer* together with a description of the types of meanings that can be attributed to their *operands*. Synonymous with *machine instruction set*.

**computerization.** (ISO) *Automation* by means of *computers*.

**computerize.** (ISO) To *automate* by means of *computers*.

**computer language.** Synonym for *machine language*.

**computer micrographics.** (ISO) Methods and techniques for recording on *microforms* of *data* produced by a *computer*, or for transforming *data* recorded on *microforms* into a form suitable for computer use.

**computer network.** (1) (ISO) A *network* of *data processing nodes* that are interconnected for the purpose of *data communication*. (2) A complex consisting of two or more interconnected *computers*. (3) See *heterogeneous computer network*, *hierarchical computer network*, *homogeneous computer network*.

**computer operation.** One of the elementary *operations* that a *computer* is designed to perform. Synonymous with *machine operation*.

**computer-oriented language.** (1) A *programming language* that reflects the structure of a given *computer* or that of a given class of *computers*. Synonymous with *low-level language*. (2) A *programming language* whose *words* and *syntax* are designed for use on a specific class of *computers*. Synonymous with *machine-oriented language*.

**computer output microfilmer.** (ISO) A device for *computer output microfilming*.

**computer output microfilming (COM).** (ISO) A technique for converting and recording *data* from a *computer* directly to a *microform*.

**computer output microfilm printer.** (ISO) Synonym for *COM printer*.

**computer program.** (ISO) A *sequence* of *instructions* suitable for *processing* by a *computer*. Processing may include the use of an *assembler*, a *compiler*, an *interpreter*, or a *translator* to prepare the program for *execution*, as well as the execution of the program. The *sequence* of *instructions* may include *statements* and necessary *declarations*.

**computer program origin.** The *address* assigned to the initial *storage location* of a *computer program* in *main storage*.

**computer science.** (ISO) The branch of science and technology that is concerned with methods and techniques relating to *data processing* performed by *automatic means*.

**computer simulator.** A *computer program* that *translates* *computer programs* prepared for a *computer* of one model for *execution* on a *computer* of a different model.



**computer system.** A *functional unit*, consisting of one or more *computers* and associated software, that uses common *storage* for all or part of a *program* and also for all or part of the *data* necessary for the execution of the program; executes *user-written* or *user-designated* programs; performs *user-designated* data manipulation, including *arithmetic operations* and *logic operations*; and that can execute programs that modify themselves during their execution. A computer system may be a standalone unit or may consist of several interconnected units. Synonymous with ADP system, computing system.

**computer system audit.** (ISO) An examination of the procedures used in a *computer system* to evaluate their effectiveness and correctness and to recommend improvements.

**computer system fault tolerance.** (ISO) The ability of a *computer system* to continue to operate correctly even though one or more of its component parts are malfunctioning. The speed of performance, the *throughput*, or both, may be diminished from normal until the *faults* are corrected. Synonymous with computer system resilience.

**computer system resilience.** (ISO) Synonym for *computer system fault tolerance*.

**computer system security.** (ISO) Synonym for *data processing system security*.

**computer time.** In *simulation*, the time required to process the *data* that represent a process or that represent a part of a process.

**computer word.** (ISO) A *word*, usually treated as a unit, that is suitable for *processing* by a given *computer*. Synonymous with *fullword*, *machine word*.

**computing system.** Synonym for *computer system*.

**conceptualization principle.** In a *conceptual schema language*, a description of only the conceptually relevant aspects, both static and dynamic, of the *universe of discourse*, excluding all aspects of external or internal *data* representation, physical data organization and access procedures, as well as particular *user* external representation such as *message* formats and *data structures*.

**conceptual level.** In a *conceptual schema language*, all aspects that deal with the interpretation, meaning, and manipulation of *information* that describes a *universe of discourse* or *entity world* in an *information system*.

**conceptual schema.** A *schema* that defines a conceptual model of a *database*.

**conceptual schema language.** A formal *language*, that is parsable by a *computer* as well as by a human being and that contains all linguistic constructs necessary to formulate the *sentences* in a *conceptual schema* and

an *information base*, and their manipulation in terms such as *action descriptions* and *command conditions*.

**conceptual subschema.** In a *conceptual schema language*, a consistent collection of *sentences* that express the *necessary propositions* that hold for a *universe of discourse* that is limited to a particular *user's* view and, as such, is part of a conceptual schema relevant for the shared *information base*.

**conceptual system design.** (ISO) A *system design* activity concerned with specifying the *system* organization and the flow of *information* through it.

**concurrent.** (1) (ISO) Pertaining to *processes* that take place within a common interval of time during which they may have to alternately share common *resources*; for example, several *programs* are concurrent when they are executed by *multiprogramming* in a *computer* having a single *instruction control unit*. (2) Contrast with *simultaneous*. (3) See also *consecutive*, *sequential*.

**condition.** See *command condition*.

**conditional construct.** (ISO) In *programming languages*, a *statement* or part of a *statement* that specifies several different *execution sequences*; for example, a CASE statement, an IF statement.

**conditional implication operation.** (ISO) Synonym for *implication*.

**conditional jump.** A *control transfer* that always requires a decision. Synonymous with *conditional transfer*.

**conditional statement.** A *statement* used to express an assignment or a *branch*, based on a specified criterion; for example, an IF-THEN statement.

**conditional transfer.** Synonym for *conditional jump*.

**conditions.** See *entry conditions*.

**configuration.** (1) (ISO) The arrangement of a *computer system* or *network* as defined by the nature, number, and the chief characteristics of its *functional units*. (2) The physical and logical elements of an *information processing system*, the manner in which they are organized and connected, or both. The term may refer to a *hardware* configuration or a *software* configuration.

**congestion.** See *reception congestion*.

**conjunction.** (ISO) The *Boolean operation* whose result has the Boolean value 1 if and only if each *operand* has the Boolean value 1. Synonymous with AND operation, intersection.

**connection.** (ISO) An association established between *functional units* for conveying *information*.

**connectivity.** The ease or practicality of connecting *functional units*.



**connect time.** (ISO) The length of time that a *terminal* is connected and able to communicate with a *computer*.

**connector.** (1) (ISO) A *flowchart* symbol that represents a break in a *flowline* and that indicates where the flowline is continued. (2) See *inconnector*, *outconnector*.

**consecutive.** (1) (ISO) In a *process*, pertaining to two events that follow one another without the occurrence of any other event between them. (2) Contrast with *sequential*.

**consecutive operation.** (ISO) Synonym for *sequential operation*.

**console.** (1) The part of a *computer* that is used for communication between the *operator* or maintenance engineer and the computer. (2) See *display console*, *operator console*.

**constant.** (1) (ISO) In *programming languages*, a *language object* that takes only one specific value. (2) See *figurative constant*.

**constant function.** (ISO) In a *calculator*, the *function* that allows a *number* to be held in *memory* for repeated use.

**construct.** See *conditional construct*, *loop construct*.

**contact bounce.** (ISO) An unwanted making and breaking of the connection while opening or closing a contact.

**contact input.** (ISO) A *binary input* to a device generated by opening or closing a mechanical or electronic switch.

**contact interrogation signal.** (ISO) A *signal* whose value indicates whether a contact is open or closed.

**contact protection.** (ISO) Protection of a mechanical contact against overcurrent or overvoltage.

**content-addressable storage.** (ISO) Synonym for *associative storage*.

**contention.** (1) (ISO) In a *local area network*, a situation in which two or more *data stations* are allowed by the *protocol* to start transmitting concurrently and thus risk *collision*. (2) (ISO) A condition that arises when two or more *data stations* attempt to transmit at the same time over a shared *channel*, or when two data stations attempt to transmit at the same time in *two-way alternate communication*.

**contingency procedure.** (ISO) A procedure that is an alternative to the normal path of a *process* if an unusual but anticipated situation occurs. A contingency procedure may be triggered by events such as an *overflow* or an *operator* intervention.

**continuous forms.** Blank paper or forms attached together so that they can be fed through a *printer* con-

tinuously. Synonymous with *fanfold paper*, *zig-zag fold paper*, *z-fold paper*.

**contrast.** The difference between the color, luminosity, reflectance, or shading of an image and the background of the image.

**control.** See *access control*, *loop control*, *numerical control*, *process control*.

**control area.** (ISO) A *storage* area used by a *computer program* to hold *control information*.

**control ball.** (ISO) A ball, rotatable about its center, that is used as an *input* device, normally as a *locator*. Synonymous with *track ball*.

**control block.** The circuitry that performs *control functions* such as decoding *microinstructions* and generating the internal *control signals* that perform the *operations* requested.

**control bus.** A *bus* carrying the *signals* that regulate *system operations*.

**control character.** (1) (ISO) A *character* whose occurrence in a particular context specifies a *control function*. A control character may be recorded for use in a subsequent action. A control character is not a *graphic character*, but may have a graphic representation in some circumstances. (2) See *accuracy control character*, *device control character*, *print control character*, *transmission control character*.

**control flow.** (ISO) In *programming languages*, an abstraction of all possible paths that an *execution sequence* may take through a *program*.

**control function.** (ISO) Synonym for *control operation*.

**control functions.** In a *data manipulation language*, the *computer instructions* that manage *access* to *system resources* so that *files* and *buffers* are made available only to authorized users and application *programs*.

**control language.** (1) (ISO) Synonym for *command language*. (2) See *job control language*.

**controller.** See *access controller*, *input/output controller*.

**control operation.** (ISO) An action that affects the recording, processing, transmission, or interpretation of *data*; for example, starting or stopping a *process*, a *carriage return*, a *font* change, a *rewind*, or an end of *transmission*. Synonymous with *control function*.

**control panel.** (1) The part of a *computer console* that contains manual controls. (2) Synonym for *plugboard*.

**control program.** (ISO) A *computer program* designed to *schedule* and to supervise the execution of programs in a *computer system*.

**control read-only memory (CROM).** A *read-only storage* in the *control block* of some *microprocessors* that has been *microprogrammed* to decode the control logic.

**control segment.** Synonym for *root segment*.

**control station.** (ISO) In *basic mode link control*, the *data station* that nominates the *master station* and supervises *polling*, *selecting*, *interrogating*, and *recovery procedures*.

**control tape.** See *carriage control tape*.

**control transfer.** In the execution of a *program*, any departure from the implicit or declared *sequence* in which the *instructions* are being executed.

**control unit.** See *instruction control unit*, *main control unit*.

**control variable.** See *loop control variable*.

**conversational.** Pertaining to an *interactive mode of operation* of a *computer system* in which a *user* and a *computer* exchange a *sequence* of related entries and responses in a manner similar to a dialog between two people. See also *interactive*.

**conversion.** (ISO) In *programming languages*, the transformation between values which represent the same *data item* but belong to different *data types*.

**convert.** To change the representation of *data* from one form to another; for example, *analog* to *digital* conversion; *media conversion*; *radix conversion*.

**converter.** See *code converter*, *data converter*.

**convex programming.** (ISO) In *operations research*, a particular case of *nonlinear programming* in which the *function* to be maximized or minimized and the constraints are appropriately convex or concave functions of the controllable variables.

**coordinate.** See *absolute coordinate*, *device coordinate*, *incremental coordinate*, *normalized device coordinate*, *relative coordinate*, *user coordinate*, *world coordinate*.

**coordinate graphics.** (ISO) *Computer graphics* in which *display images* are generated from *display commands* and coordinate data. Synonymous with *line graphics*.

**copy.** (1) (ISO) To *read data* from a source, leaving the source data unchanged, and to *write* the same data elsewhere on a *data medium* that may differ from that of the source; for example, to copy a *file* from a *magnetic tape* onto a *magnetic disk*. (2) (ISO) The reproduction of selected recorded *text* from *memory* or from a *recording medium* to another recording medium.

**core.** See *magnetic core*, *multiaperture core*, *switch core*.

**core image.** (ISO) Synonym for *storage image*.

**core storage.** See *magnetic core storage*.

**correcting feature.** (ISO) A means of removing or blocking out typed *characters*.

**corrective maintenance.** (ISO) Maintenance performed specifically to overcome existing *faults*.

**corrective maintenance time.** Time, either scheduled or unscheduled, used to perform *corrective maintenance*.

**counter.** (1) (ISO) A *functional unit* with a finite number of states each of which represents a *number* that can be, upon receipt of an appropriate *signal*, increased by unity or by a given constant; the device is usually capable of bringing the represented number to a specified value, for example, zero. (2) See *instruction counter*, *keystroke counter*, *line counter*, *modulo-n counter*, *program counter*, *reversible counter*.

**CPU.** *Central processing unit*.

**CR.** (1) An abbreviation denoting a credit symbol in the amount field. (2) The carriage return character.

**CRC.** The *cyclic redundancy-check character*.

**credit card.** An *identification card* that allows deferred payment for a financial transaction.

**critical section.** (ISO) In an *asynchronous procedure* of a *computer program*, a part that cannot be executed simultaneously with an associated critical section of another asynchronous procedure.

**CROM.** *Control read-only memory*.

**cross-assembler.** An *assembler* that can run *symbolic language input* on one type of *computer* and produce *machine language output* for another type of computer.

**crossfooting.** (ISO) Checking in which individual *columns* are totaled and the sum of these totals is compared with the sum of the totals of the individual rows.

**crosstalk.** (ISO) The disturbance caused in a *circuit* by an unwanted transfer of energy from another circuit.

**CRT display.** *Cathode ray tube display*.

**cryogenics.** The study and use of devices utilizing properties of materials at low temperatures.

**cryogenic storage.** (ISO) A *storage device* that uses the superconductive and magnetic properties of certain materials at low temperatures.

**cryotron.** A device that makes use of the effects of low temperatures on conductive materials such that small magnetic field changes can control large current changes.

**cursor.** A movable, visible mark used to indicate a position of interest on a *display surface*.

**curtate.** (1) A group of adjacent *card rows*. (2) See *lower curtate*, *upper curtate*.

**curve follower.** (ISO) An *input unit* that reads data represented by a curve.

**curve generator.** (ISO) A *functional unit* that converts a *coded representation* of a curve into the *graphic representation* of the shape of the curve for *display*.

**cut and paste.** (ISO) In *text processing*, a function that enables the *user* to designate a *block of text* and to move it from one point to another within a *document* or into another document. Synonymous with *block move*.

**cutover.** (ISO) The *operation* that *transfers* the current *system* to its successor at a given moment.

**cybernetics.** The branch of learning that brings together theories and studies on communication and control in living organisms and in machines.

**cycle.** (1) An interval of space or time in which one set of events or phenomena is completed. (2) Any set of *operations* that is repeated regularly in the same *sequence*. The operations may be subject to variations on each repetition. (3) See *search cycle*.

**cycle time.** (1) (ISO) The minimum time interval between the starts of successive *read-write cycles* of a *storage device*. (2) See *access time*, *read-cycle time*, *write-cycle time*.

**cyclic redundancy check.** (ISO) A *redundancy check* in which the *check key* is generated by a *cyclic algorithm*.

**cyclic redundancy-check character (CRC).** A *character* used in a modified cyclic code for *error detection* and *correction*.

**cyclic shift.** Synonym for *end-around shift*.

**cyclic storage.** Synonym for *circulating storage*.

**cylinder.** (ISO) In an assembly of *magnetic disks*, the set of all *tracks* that can be accessed by all the *magnetic heads* of a comb in a fixed position.



## D

**DAC.** (ISO) *Digital-to-analog converter.*

**daisy chain.** A method of device interconnection for determining *interrupt* priority by connecting the interrupt sources *serially*.

**daisy wheel printer.** (ISO) An *impact printer* in which the *type slugs* are mounted at the ends of spring fingers that are attached to a central hub.

**DASD.** *direct access storage device.*

**data.** (1) (ISO) A representation of facts, concepts, or *instructions* in a formalized manner suitable for communication, interpretation, or *processing* by humans or by *automatic* means. (2) Any representations such as *characters* or *analog* quantities to which meaning is or might be assigned. (3) See *alphanumeric data*, *analog data*, *derived data*, *digital data*, *discrete data*, *input data*, *numeric data*, *output data*.

**data administration.** The *function* of controlling the acquisition, analysis, *storage*, *retrieval*, and distribution of *data*. Synonymous with *data management*.

**data administrator.** The person who defines, organizes, manages, controls, and protects *data*.

**data aggregate.** (1) An occurrence of a collection of *data items*. (2) A *data element* that is composed of two or more *data items* that are arranged in a specified order within a *record*, and that allows reference to the whole *aggregate* or to the individual items. (3) Synonymous with *composite data element*, *data chain*.

**data attribute.** A characteristic of a *data element* such as length, value, or method of representation.

**data bank.** (ISO) A *set of data* related to a given subject and organized in such a way that it can be consulted by *users*.

**database.** (1) A collection of interrelated *data*, often with controlled redundancy, organized according to a *schema* to serve one or more applications; the *data* are *stored* so that they can be used by different *programs* without concern for the *data structure* or organization. A common approach is used to add new *data* and to modify and retrieve existing *data*. (2) See *archival database*, *distributed database*.

**database administrator.** The person who defines, organizes, manages, controls, and protects a *database*.

**database key.** A unique value that serves as a *pointer* that identifies a *record* in the *database* to a *run unit*, and that may be used by the *run unit* to reselect the same *record*.

**database management system (DBMS).** (1) An integrated *set of computer programs* that collectively provide all of the capabilities required for centralized management, organization, and control of access to a *database* that is shared by many *users*. (2) A *computer-based system* used to establish, make available, and maintain the *integrity* of a *database*, that may be invoked by nonprogrammers or by application *programs* to define, create, revise, retire, interrogate, and *process transactions*; and to update, back up, recover, validate, secure, and monitor the *database*.

**database schema.** In a *conceptual schema language*, the definition of the representation forms and structure of a *database* for the possible collection of all *sentences* that are in the conceptual schema and in the *information base*, including manipulation aspects of these forms.

**data bus.** A *bus* used to communicate *data* internally and externally to and from a *processing unit* or a *storage device*.

**data card.** See *source data card*.

**data chain.** Synonym for *data aggregate*.

**data check.** (ISO) An *operation* used to verify *data quality* or *data integrity*.

**data circuit.** (1) (ISO) A pair of associated transmit and receive *channels* that provide a means of two-way *data communication*. Between *data switching exchanges*, the data circuit may or may not include *data circuit-terminating equipment*, depending on the type of *interface* used at the data switching exchange. Between a *data station* and a data switching exchange or a *data concentrator*, the data circuit includes the data circuit-terminating equipment at the data station end, and may include similar equipment at the data switching exchange or data concentrator location. (2) See Figure 6. (3) See *tandem data circuit*.

**data circuit-terminating equipment (DCE).** (1) (ISO) In a *data station*, the equipment that provides *signal conversion*, coding, and other *functions* at the *network end* of the *line* between the *data terminal equipment* and the line, and that may be a separate or integral part of the data terminal equipment or of the *intermediate equipment*. (2) See Figure 6.

**data circuit transparency.** (ISO) The capability of a *data circuit* to transmit all *data* without changing the data content or structure.

**data code.** (1) A structured *set of characters* that may be used to represent *data items*; for example, the use of 01, 02, ... 12 to represent the months of the year. (2) A representation of *data* that is produced by a *code* (1). (3) Contrast with *abbreviation*.

**data collection station.** (ISO) Synonym for *data input station*.

**data communication.** (1) (ISO) The *transfer of data* between *functional units* by means of *data transmission* according to a *protocol*. (2) The *transmission* and *reception of data*. (3) The *transmission, reception, and validation of data*.

**data compression.** The use of techniques, such as null suppression, *bit* mapping, and pattern substitution, for purposes of reducing the amount of space required for *storage of textual files and data records*.

**data concentrator.** (ISO) A *functional unit* that permits a common *transmission medium* to serve more *data sources* than there are *channels* currently available within the *transmission medium*.

**data contamination.** (ISO) Synonym for *data corruption*.

**data content.** (ISO) Synonym for *data inventory*.

**data converter.** (ISO) A *functional unit* that transforms *data* from one representation to an equivalent representation.

**data corruption.** (ISO) A violation of *data integrity*. Synonymous with *data contamination*.

**data definition.** The *process of creating a schema* by identifying and describing *data elements* and their *relationships* that make up the *database structure*.

**data definition language (DDL).** A *programming language* used to define the logical and physical structure of a *database*; that is, the *language* used for defining the *database schema*.

**data density.** The number of *bits* that can be stored per unit length of a *recording medium*.

**data dictionary.** (1) A *database* used for *data* that refers to the use and structure of other *data*; that is, a *database* for the *storage of metadata*. (2) An inventory that describes, defines, and lists all of the *data elements* that are stored in a *database*. (3) A *subset of a data dictionary/directory* that provides definitions for each *data element*. (4) Loosely, a *data dictionary system*. (5) Loosely, a *data directory*. (6) Loosely, a *data directory system*. (7) Loosely, a *data dictionary/directory*. (8) Loosely, a *data dictionary/directory system*. (9) Synonymous with *data element dictionary*.

**data dictionary/directory (DD/D).** (1) A *database* that combines the the *functions of a data dictionary* and a *data directory*. (2) An inventory of *data resources* that controls the totality of *data elements* within an application and that serves as the repository of all descriptive *information* about each *data element*, including *location information*. (3) Loosely, a *data dictionary/directory system*. (4) Loosely, synonym for *information resource dictionary*.

**data dictionary/directory system (DD/DS).** (1) A *computer software system* that maintains and manages a *data dictionary/directory*. (2) Loosely, synonym for *information resource dictionary system*.

**data dictionary system.** A *computer software system* that maintains and manages a *data dictionary*.

**data directory.** (1) An inventory that specifies the source, location, ownership, usage, and destination of all of the *data elements* that are stored in a *database*. (2) A *subset of a data dictionary/directory* that has the *functions of (1)*.

**data directory system.** The *computer software system* that manages and maintains a *data directory*.

**data element.** (1) (ISO) A named unit of *data* that, in some contexts, is considered indivisible and in other contexts may consist of *data items*. (2) A named *identifier* of each of the *entities* and their *attributes* that are represented in a *database*. (3) See *derived data element*.

**data element dictionary.** Synonym for *data dictionary*.

**data glossary.** A reference document that lists all of the *data elements* stored in a *database* and provides for each element a definition of its meaning and a specification of its uses in that *database*; the glossary may be included in a *data dictionary*, or it may be published separately for easy reference.

**datagram.** (ISO) In *packet switching*, a self-contained *packet*, independent of other *packets*, that carries *information* sufficient for routing from the originating *data terminal equipment* to the destination *data terminal equipment*, without relying on earlier exchanges between the equipments and the *network*.

**datagram service.** (ISO) In *packet switching*, a service that routes a *datagram* to the destination identified in its *address field* without reference by the *network* to any other *datagram*. Datagrams may be delivered to a destination address in an *order* different from that in which they were entered into the *network*.

**data independence.** (1) The organization, storage, or retrieval of *data* or *programs* in a way not dependent upon the manner specified in *user programs*. (2) The property of a *database management system* that insulates application programs from the complexities of the *data structure*.

**data input station.** (ISO) A *user terminal* that is used primarily for entering *data* into a *computer*. Synonymous with *data collection station*.

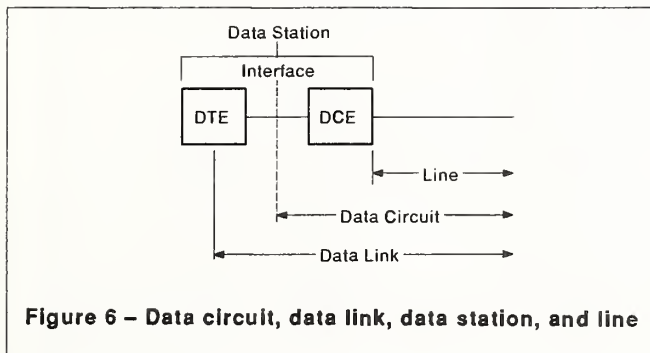
**data integrity.** (1) The state that exists when *data* is handled as intended and is not exposed to accidental or malicious modification, destruction, or disclosure. (2) The preservation of *data* for its intended use. (3) See also *data security, system integrity*.



**data inventory.** (ISO) In an *information processing system*, all the *data* and their characteristics, including interdependencies. Synonymous with *data content*.

**data item.** A named component of a *data element*; usually the smallest component.

**data link.** (1) (ISO) The assembly of parts of two *data terminal equipments* that are controlled by a *link protocol* and the interconnecting *data circuit* and that enable *data* to be transferred from a *data source* to a *data sink*. (2) See Figure 6.



**data network.** (ISO) An arrangement of *data circuits* and switching facilities for establishing *connections* between *data terminal equipments*.

**data object.** In *programming languages*, an element of *data structure* such as a *file*, an *array*, or an *operand*, that is needed for the *execution of programs* and that is named or otherwise specified by the allowable *character set* of the *language* of the program.

**data processing.** (1) (ISO) The systematic performance of *operations* upon *data* such as *handling*, *merging*, *sorting*, *computing*. (2) See *automatic data processing*. (3) See also *information processing*.

**data processing center.** Synonym for *computer center*.

**data processing node.** (ISO) In a *computer network*, a *node* at which *data processing equipment* is located.

**data processing station.** (ISO) At a *data processing node*, the *data processing equipment* and associated *software*.

**data processing system.** (1) (ISO) A *system*, comprising *functional units* such as a *computer*, *peripheral equipment*, and *software* to perform *data processing*. (2) See also *information processing system*.

**data processing system security.** (ISO) The technological and administrative safeguards established and applied to a *data processing system* to protect *hardware*, *software*, and *data* from accidental or malicious modifications, destruction, or disclosure. Synonymous with *computer system security*.

**data protection.** (ISO) The establishment and enforcement of appropriate administrative, technical, or physical means to guard against the unauthorized interrogation procedures and use of *data*.

**data quality.** (ISO) The correctness, timeliness, *accuracy*, completeness, relevance, and accessibility that make *data* appropriate for use.

**data reduction.** The transformation of raw *data* into a more useful form; for example, *smoothing* to reduce *noise*.

**data resource.** Any *data* created manually or by *automatic* means, used by a *system* or enterprise to represent its *information*.

**data resource management.** The responsibility for planning, organizing, and controlling *data resources* consistent with the overall goals and objectives of an enterprise. See also *information resource management*.

**data security.** The protection of *data* from accidental or intentional modification or destruction and from accidental or intentional disclosure to unauthorized personnel. See also *data integrity*.

**data link escape character (DLE).** (ISO) A *transmission control character* that changes the meaning of a limited number of contiguously following *characters* or *coded representations*.

**data logging.** See *logging*.

**data management.** (1) In an *operating system*, the *programs* that provide access to *data*, perform or monitor organization and *storage* of *data*, and control *input/output devices*. (2) Synonym for *data administration*.

**data manipulation language (DML).** A *programming language* used to *store*, *retrieve*, and *update* the *data* in a *database*.

**data medium.** (ISO) The material in or on which *data* may be represented.

**data medium protection device.** (ISO) A portable or removable device that allows *read-only* use of a *data medium*.

**data model.** (1) In a *database*, the *user's* logical view of the *data* in contrast to the physically *stored data*, or *storage structure*. (2) A description of the organization of *data* in a manner that reflects the *information structure* of an enterprise. (3) See *entity-relationship data model*.

**data module.** (ISO) A removable and hermetically sealed *disk pack* that incorporates a *read/write assembly* and *disks*.

**data multiplexer.** (ISO) A *functional unit* that permits two or more *channels* to share a common *transmission medium*.



**data-sensitive fault.** (ISO) A *fault* that is revealed as a result of the *processing* of a particular pattern of *data*.

**data signalling rate.** (ISO) The aggregate of the number of *bits* per second in the *transmission* path of a *data transmission* system.

**data sink.** (ISO) The *functional unit* that accepts transmitted *data*.

**data source.** (ISO) The *functional unit* that originates *data* for *transmission*.

**data station.** (1) (ISO) The *data terminal equipment*, the *data circuit-terminating equipment*, and any *intermediate equipment*; the *data terminating equipment* may be connected directly to a *data processing system* or may be a part of the latter. (2) See Figure 6.

**data streaming.** The uninterrupted *transfer* of *information* over an *interface* in order to achieve high *data transfer rates*.

**data structure.** The *relationships* that exist among units of *data*. See *logical data structure*, *physical data structure*.

**data switching exchange (DSE).** (ISO) The equipment installed at a single location to perform *switching functions* such as *circuit switching*, *message switching* and *packet switching*.

**data terminal equipment (DTE).** (ISO) That part of a *data station* that serves as a *data source*, a *data sink*, or both. (2) See Figure 6.

**data transfer phase.** (ISO) That phase of a *call* during which *user data* may be *transferred* between *data terminal equipments* that are interconnected via the *network*.

**data transfer rate.** (1) (ISO) The average number of *bits*, *characters*, or *blocks* per unit time passing between corresponding equipments in a *data transmission* system. (2) See *effective transfer rate*.

**data transmission.** (ISO) The conveying of *data* from one place for reception elsewhere by *telecommunication* means.

**data transmission channel.** (ISO) Synonym for *channel*.

**data type.** (1) (ISO) A set of values and a set of allowable *operations* on those values. (2) The characteristics and *attributes* of *data*; for example, length, precision, alphanumeric representation.

**data validation.** (1) (ISO) A process used to determine if *data* are inaccurate, incomplete, or unreasonable; the process may include *format checks*, *completeness checks*, *check key tests*, *reasonableness checks* and *limit checks*. (2) The checking of *data* for correctness or compliance with applicable standards, rules, and conventions.

**data value.** An instance of a *data item*. Synonymous with *value*.

**data volatility.** Pertaining to the rate of change in the values of stored *data* over a period of time.

**datum line.** See *x-datum line*, *y-datum line*.

**DBMS.** *Database management system*.

**DC1, DC2, DC3, DC4.** *Device control characters*.

**DCE.** *Data circuit-terminating equipment*.

**DDA.** *Digital differential analyzer*.

**DD/D.** *Data dictionary/directory*.

**DDL.** *Data definition language*.

**DD/DS.** *Data dictionary/directory system*.

**deadlock.** (1) Unresolved contention for the use of a resource. (2) An error condition in which *processing* cannot continue because each of two elements of the process is waiting for an action by or a response from the other. (3) An impasse that occurs when multiple processes are waiting for the availability of a resource that will not become available because it is being held by another process that is in a similar wait state. (4) Synonymous with *deadly embrace*.

**deadly embrace.** Synonym for *deadlock*.

**dead-zone unit.** (ISO) A *functional unit* whose output *analog variable* is constant over a particular range of the *input analog variable*.

**debit card.** An *identification card* that may be used to transfer funds from one account to another.

**debossed character.** A *character* that is depressed in relief into the surface of a medium such as a *credit card*. Contrast with *embossed character*.

**deblock.** To separate the parts of *blocks*; for example, to remove *records* from a block.

**debug.** (ISO) To detect, to diagnose, and to eliminate errors in *programs*.

**decimal.** (ISO) Pertaining to a selection, choice or condition that has ten possible different values or states. Synonymous with *denary*.

**decimal digit.** (ISO) One of the *digits* 0 through 9 in the *decimal notation* system.

**decimal marker.** (ISO) On a *calculator*, a visual indication of the position of the *decimal* point or decimal comma in a *number*.

**decimal mode.** See *fixed decimal mode*, *floating decimal mode*.

**decimal notation.** (1) A *notation* system that uses ten different *characters*, usually the *decimal digits*; for example, the character string 196912312359, construed to represent the date and time one minute before the

start of the year 1970; the representation used in the Universal Decimal Classification (UDC). (2) Contrast with decimal numeration system.

**decimal numeral.** A *numeral* in the *decimal numeration system*.

**decimal numeration system.** (1) (ISO) The *fixed radix numeration system* that uses the *decimal digits* and the *radix* ten and in which the lowest integral *weight* is one; for example, in this numeration system, the numeral 576.2 represents the number  $5 \times 10^2 + 7 \times 10^1 + 6 \times 10^0 + 2 \times 10^{-1}$ . (2) Contrast with decimal notation.

**decimal point.** (ISO) The *radix point* in the *decimal numeration system*; it may be represented, according to various conventions, by a period, by a comma, or by a point at the mid-height of the *digits*.

**decimal tabulation.** In a list of figures, the *automatic vertical alignment of decimal points*, such as commas or periods, in a single *column*.

**decision.** See *leading decision*, *trailing decision*.

**decision table.** (ISO) A table of all contingencies that are to be considered in the description of a problem, together with the actions to be taken for each set of contingencies.

**declaration.** (1) (ISO) In a *programming language*, an explicit specification of the computing environment or of the characteristics, *attributes*, or aspects of one or more *identifiers* in a *program*; for example, the declaration of a *collating sequence*, or of the attributes of a *variable*. (2) See *implicit declaration*.

**decode.** (1) (ISO) To convert *data* by reversing the effect of some previous *encoding*. (2) To interpret a *code*.

**decoder.** (ISO) A *functional unit* that has a number of *input lines* such that any number may carry *signals* and a number of *output lines* such that no more than one at a time may carry a signal; the combination of input signals serves as a *code* to indicate which output line carries the signal.

**decollate.** To separate the plies of a multipart form or paper stock. Synonymous with *deleave*.

**default.** Pertaining to an attribute, value, or option that is assumed when none is explicitly specified.

**default option.** An implicit option that is assumed when no option is explicitly stated.

**deference.** (ISO) A *process* by which a *data station* delays its *transmission* when the *transmission medium* is busy, to avoid *collision* with ongoing transmission.

**deferred maintenance.** *Maintenance* specifically intended to eliminate an existing *fault* that did not

prevent continued successful operation of a device or *computer program*.

**DEL.** The *delete character*.

**delay element.** (ISO) A device that yields, after a given time interval, an *output signal* essentially similar to a previously introduced *input signal*.

**delay line.** (1) (ISO) A line or *circuit* designed to introduce a desired delay in the *transmission* of a *signal*. (2) See *acoustic delay line*, *electromagnetic delay line*, *magnetic delay line*.

**deleave.** Synonym for *decollate*.

**delete.** To erase *data* from storage.

**delete character (DEL).** A *control character* used primarily to obliterate an erroneous or unwanted *character*; on *perforated tape* this character is represented by a hole in each *punch position*.

**deletion.** (1) The removal of *data* from storage. (2) In a *conceptual schema language*, the removal of a previously inserted *sentence* from the *information base* or *conceptual schema*.

**delimiter.** (ISO) A *character* used to indicate the beginning or the end of a *character string*. Synonymous with *separator*.

**demand paging.** (ISO) The *transfer* of a *page* from *auxiliary storage* to *real storage* at the moment of need.

**demodulator.** (ISO) A *functional unit* that converts a modulated *signal* into the original signal.

**demultiplexer.** A device that recovers as *output signals* each of the signals combined by a *multiplexer*.

**denary.** (ISO) Synonym for *decimal*.

**density.** See *bit density*, *data density*, *physical recording density*, *track density*.

**dependency.** A *relationship* between two *entities*, which denotes that the existence of one entity is of interest only if the other entity exists.

**dependent code.** A *code* that has *segments* that are dependent upon other segments in order to provide unique identification of a coded *item*.

**dependent compilation.** Synonym for *separate compilation*.

**derived data.** *Data values* that are derived from the values of other *data* by a specified *algorithm*.

**derived data element.** A *data element* that has a *domain* identical to that of a specified general data element; for example, country of citizenship is derived from the element, countries of the world.

**descender.** The part of a *character* that extends below the *writing line* to the bottom of the *character box*; for



example, in certain *fonts*, the lower strokes of *letters* such as g, j, p, and q. *Letter-quality printers* and some *dot-matrix printers* use descenders. Contrast with *ascender*.

**descriptive name.** In an *information resource dictionary*, the combination of *assigned descriptive name* and *version identifier* that provides a unique and more descriptive name for the *access name*.

**descriptor.** In *information retrieval*, a word used to categorize or index *information*. Synonymous with *keyword* (2).

**design.** See *conceptual system design*, *functional design*, *logic design*, *system design*.

**desk checking.** (ISO) The manual *simulation* of *program execution* to detect *faults* through step-by-step examination of a *source program* for errors in *function* or *syntax*.

**desktop calculator.** (ISO) A *calculator* designed primarily for use on a desk or table.

**desktop publishing.** *Computer-aided publishing* using *data processing* equipment small enough to fit on a desk top or table and suitable for an *end user*.

**destructive read.** (ISO) A *reading* that erases the *data* in the source location.

**detectable element.** (ISO) A *display element* that can be detected by a *pick device*.

**detectable segment.** (ISO) A *display segment* that can be detected by a *pick device*.

**development time.** That part of *operating time* used for *debugging* new *routines* or *hardware*.

**device.** See *character display device*, *choice device*, *display device*, *logic device*, *paging device*, *pick device*, *point-of-sale device*, *raster display device*, *storage device*, *stroke device*.

**device-control character.** (ISO) A *control character* used to specify a *control function* for peripheral devices associated with a *computer system*.

**device coordinate.** (1) (ISO) A coordinate specified in a coordinate system that is device dependent. (2) See *normalized device coordinate*.

**device media control language.** (1) In a *database management system*, the *language* that may be used to assign *data* to *storage space* on specific devices and to express *statements* that describe and control *data transfer operations* such as *buffering*, *paging*, and *overflow*. (2) A *language* that may be used to describe the organization and physical location of *data* and to map the *data* onto physical *storage media*.

**device space.** (ISO) The space defined by the complete set of *addressable points* of a *display device*.

**diagnostic.** Pertaining to the detection and isolation of a *malfunction* or *mistake*.

**diagnostic function.** (ISO) The capability of a *functional unit* to detect problems and to identify the type of *error*.

**diagnostic program.** (ISO) A *computer program* that recognizes, locates, and explains either a *fault* in equipment or a *mistake* in another program.

**diagram.** See *block diagram*, *functional diagram*, *logic diagram*, *Veitch diagram*, *Venn diagram*.

**dichotomizing search.** (ISO) A *search* in which an ordered set of *data* is partitioned into two mutually exclusive parts, one of which is rejected; the process is repeated on the accepted part until the search is completed.

**dictionary.** (1) The *database* of *metadata*. (2) A *database* of specifications and *information processing resources*. Synonymous with *table* (2). (3) See *data dictionary*, *information resource dictionary*, *relocation dictionary*.

**dictionary administrator.** The person who defines, organizes, manages, controls, and protects a *dictionary*.

**dictionary/directory.** See *data dictionary/directory*.

**difference.** (ISO) In a subtraction operation, the *number* or *quantity* that is the result of subtracting the *subtrahend* from the *minuend*.

**differential amplifier.** (ISO) An amplifier that has two *input circuits* and that amplifies the difference between the two *input signals*.

**differential analyzer.** (1) An *analog computer* that uses interconnected *integrators* to solve differential equations. (2) See *digital differential analyzer*.

**differential gear.** In *analog computers*, a mechanism that can be used for addition or subtraction, and that relates the angles of rotation of three shafts, usually designed so that the algebraic sum of the rotation of two shafts is equal to twice the rotation of the third.

**differential Manchester encoding.** (1) (ISO) A *digital encoding technique* in which each *bit period* is divided into two complementary halves: a transition at the beginning of the bit period represents one of the two *binary digits* "1" and "0", according to an established convention, while an absence of transition at the beginning of the bit period represents the other binary digit. (2) See also *Manchester encoding*.

**differentiator.** A device whose *output function* is proportional to the derivative of the *input function* with respect to one or more *variables*; for example, a resistance-capacitance network used to select the leading and trailing edges of a *pulse signal*.



**digit.** (ISO) A *character* that represents a nonnegative integer. Synonymous with *numeric character*. (2) See *binary digit*, *borrow digit*, *carry digit*, *check digit*, *decimal digit*, *significant digit*.

**digital.** Pertaining to *data* that consists of *digits*.

**digital computer.** A *computer* that consists of one or more associated *processing units*, and that is controlled by internally-stored *programs* and operates on *data* stored in *digital* form; it may be a standalone unit or it may consist of several interconnected units.

**digital data.** (ISO) *Data* represented by *digits*, perhaps with *special characters* and the *space character*.

**digital differential analyzer (DDA).** A *differential analyzer* that uses *digital* representations for *analog* quantities; for example, an *incremental computer* in which the principal type of computing unit is a *digital* integrator whose operation is similar to the operation of an integrating mechanism.

**digital optical disk.** (ISO) Synonym for *optical disk*.

**digital representation.** (ISO) A *discrete representation* of a quantized value of a *variable*; for example, the representation of a *number* by *digits*, by *special characters*, or by the *space character*.

**digital-to-analog converter.** (ISO) A *functional unit* that converts *data* from a *digital* representation to an *analog* representation.

**digitize.** (ISO) To express or represent in *digital* form *data* that are not *discrete*; for example, to obtain a *digital* representation of the magnitude of a physical quantity from an *analog* representation of that magnitude.

**digit place.** (ISO) In a *positional representation* system, each site that may be occupied by a *character* and that may be identified by an ordinal *number* or by an equivalent identifier. Synonymous with *digit position*, *symbol rank*.

**digit position.** (ISO) Synonym for *digit place*.

**digit punch.** A *punch* in rows 1, 2, ..., 9 of a *punched card*.

**diminished radix complement.** (ISO) A *complement* obtained by subtracting each *digit* of a *number* from the number that is one less than the *radix* of that *digit place*. Synonymous with *radix-minus-one complement*.

**dipole modulation.** Synonym for *nonpolarized return-to-zero* recording.

**direct access.** (1) (ISO) The capability to obtain *data* from a *storage device* or to enter *data* into a *storage device* in a *sequence* independent of their relative position, by means of *addresses* that indicate the physical location of the *data*. (2) Pertaining to the organiza-

tion and access *method* that must be used for a *storage structure* in which *locations* of records are determined by their *keys*, without reference to an *index* or to other records that may have been previously accessed.

**direct access storage.** (ISO) A *storage device* that provides *direct access* to *data*.

**direct address.** An *address* that designates the *storage location* of an item of *data* to be treated as an *operand*.

**direct call facility.** (ISO) A *user facility* that permits *calling* without requiring the *user* to provide *address selection signals*; the *network* interprets the call request *signal* as an *instruction* to establish a *connection* to one or more predetermined *data stations*.

**directed-beam display device.** (ISO) Synonym for *calligraphic display device*.

**direct memory access (DMA).** (ISO) A technique for moving *data* directly between *main storage* and *peripheral equipment* without requiring processing of the *data* by the *processing unit*.

**directory.** See *data directory*.

**direct percentage function.** (ISO) In a *calculator*, the *function* that directly calculates a percentage markup or discount *value*.

**disaster dump.** A *dump* made when a nonrecoverable error occurs in a *computer program*.

**disc.** Alternate spelling for *disk*.

**discrete.** (ISO) Pertaining to *data* that consists of distinct elements such as *characters*, or to physical quantities having distinctly recognizable values.

**discrete data.** (ISO) *Data* represented by *characters*.

**discrete programming.** Synonym for *integer programming*.

**discrete representation.** (ISO) A representation of *data* by *characters* so that each character or group of characters designates one of a number of alternatives.

**discretionary hyphen.** Synonym for *soft hyphen*.

**disjunction.** (ISO) The *Boolean operation* whose result has the Boolean value 0 if and only if each *operand* has the Boolean value 0. Synonymous with *inclusive-OR operation*, *OR operation*.

**disk.** See *digital optical disk*, *hard disk*, *fixed disk*, *flexible disk*, *magnetic disk*, *nonremovable disk*, *optical disk*.

**disk cartridge.** (ISO) An assembly of one or more disks that can be removed as a whole from a *disk drive*, together with the associated container from which the disk cannot be separated.

**disk drive.** A device for moving *disks* and controlling their movement.

**diskette.** (ISO) A small *magnetic disk* enclosed in a jacket.

**disk pack.** (ISO) An assembly of *magnetic disks* that can be removed as a whole from a *disk drive*, together with a container from which the assembly must be separated when operating.

**dispatch.** (ISO) To allocate time on a *processor* to *jobs* or *tasks* that are ready for execution.

**display.** (1) (ISO) A visual presentation of *data*. (2) (ISO) To present *data* visually. (3) See *cathode ray tube display*.

**display and printing calculator.** (ISO) A *calculator* that provides the *data output* facilities of a *display calculator* and, if selected by the user, a *printing calculator*.

**display calculator.** (ISO) A *calculator* in which the *data output* is shown in the form of nonpermanent characters.

**display command.** (ISO) A *command* that changes the state or controls the action of a *display device*. Synonymous with *display instruction*.

**display console.** (ISO) A *console* that includes at least one *display surface* and that may also include one or more *input devices*.

**display device.** (1) (ISO) An *output unit* that gives a visual representation of *data*, usually temporarily; however, arrangements may be made for producing a *hard copy* of this representation. (2) See *character display device*, *raster display device*.

**display element.** (1) (ISO) A basic graphic element that can be used to construct a *display image*, such as a dot, a line segment, a *character string*. Synonymous with *graphic primitive*, *output primitive*. (2) See Figure 7.

**display group.** Synonym for *display segment*

**display image.** (1) (ISO) A collection of *display elements* or *segments* that are represented together at any one time on a *display surface*. (2) See Figure 7.

**display instruction.** (ISO) Synonym for *display command*.

**display line.** (ISO) The *writing line* on a *display device*.

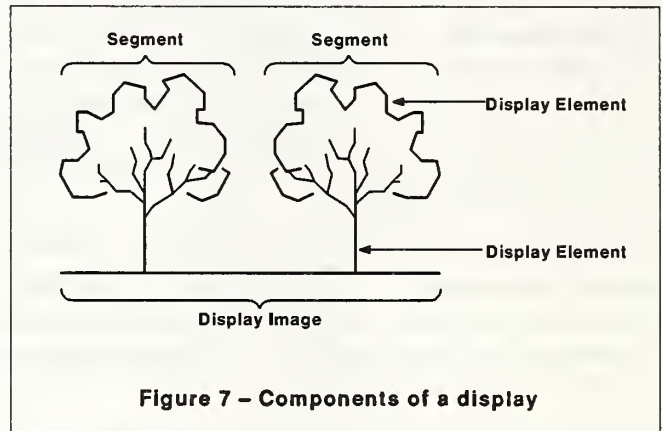
**display position.** In *computer graphics*, any position in a *display space* that can be occupied by a *picture element*.

**display recall control.** (ISO) On a *battery-powered calculator*, a control used to recall a *display* that has been blanked out by battery-saving circuitry.

**display segment.** (1) In *computer graphics*, a collection of *display elements* that can be manipulated as a unit. A display segment may consist of several display elements such as dots, arcs, or line segments. (2) Synonymous with *display group*. (3) See Figure 7.

**display space.** (ISO) That portion of the *device space* corresponding to the area available for *displaying* images. Synonymous with *operating space*.

**display surface.** (1) (ISO) In a *display device*, that medium on which *display images* may appear; for example, the screen of a cathode ray tube, the paper in a *plotter*. (2) See Figure 7.



**distributed database.** (1) A *database* that is not stored in a central location, but is dispersed over a *network* of interconnected *computers*. (2) A *database* under the overall control of a central *database management system*, but whose *storage devices* are not all attached to the same *processor*. (3) A *database* that is physically located in two or more distinct locations.

**distributed processing.** (ISO) *Data processing* in which some or all of the processing, *storage*, and *control functions*, in addition to *input/output functions*, are dispersed among *data processing stations*.

**distributed system.** A system that performs *distributed processing*.

**DLE.** The *data link escape character*.

**DMA.** *Direct memory access*.

**document.** A medium and the *information* recorded on it that generally has permanence and that can be read by man or machine.

**document administrator.** The person who defines, organizes, manages, controls, and protects *documents*.

**document assembly.** The *process* of merging and displaying *text* in a predetermined sequence to create a complete, distinct collection of *information* pertaining to a specific subject or related subjects.



**documentation.** (1) The aids provided for the understanding of the structure and intended uses of an *information system* or its components, such as *flowcharts*, textual material, and *user manuals*. (2) A collection of *documents* on a given subject. (3) See *system documentation*.

**document mark.** In *micrographics*, an optical mark within the recording area and outside the image on a roll of *microfilm* that may be used to automatically count images or film frames.

**document reader.** (ISO) A *character reader* whose *input* is *text* from specific areas on a given type of form.

**document reference edge.** In *character recognition*, a specified edge with respect to which the alignment of *characters* on the *document* is defined.

**domain.** (1) The set of possible *data values* of an *attribute*. (2) The set of permissible *data values* from which actual values are taken for a particular *attribute* or specific *data element*. (3) In a *relational database*, all of the permissible *tuples* for a given *relation*. (4) In *distributed data processing*, that part of a *network* at which *data processing resources* are under common control.

**dot-matrix character generator.** (ISO) A *character generator* that produces *character images* composed of line *segments*.

**dot-matrix printer.** (ISO) A *printer* or a *plotter* that prints *characters* or line images that are represented by dots. Synonymous with *matrix printer*.

**double-ended queue.** A *list* of variable length whose contents may be changed by adding or deleting *data items* at either end.

**double-length register.** (ISO) Two *registers* that function as a single register that may be used for *storing* the product of multiplication; *storing* the partial quotient in division; and for *accessing* the left- or right-hand portions in *character string* manipulation. Synonymous with *double register*.

**double precision.** (ISO) Pertaining to the use of two *computer words* to represent a *number* in accordance with specific *precision* requirements.

**double-pulse recording.** (ISO) *Phase modulation recording* with unmagnetized regions on each side of the magnetized regions.

**double-rail logic.** Self-timing asynchronous circuits in which each *logic variable* is represented by two electrical lines which together can take on three meaningful states: zero, one, and undecided.

**double register.** (ISO) Synonym for *double-length register*.

**doublet.** (ISO) A *byte* composed of two *bits*. Synonymous with two-bit byte.

**double word.** A sequence of contiguous *bits* or *characters* that comprise two *computer words* and that may be addressed as a unit.

**downlink.** (ISO) In a *broadband local area network*, pertaining to *data transmission* from the *headend* to a *data station*.

**down time.** (ISO) The time during which a *functional unit* cannot be used because of a *fault* within the functional unit or within the environment.

**dragging.** (ISO) Moving one or more *segments* on a *display surface* by *translating* the segments along a path determined by a *locator*.

**drift.** (ISO) The unwanted change of the value of an *output signal* of a device over a specified period of time when the values of all *input signals* of the device are kept constant.

**drive.** See *disk drive*, *magnetic tape drive*, *staging drive*, *streaming tape drive*.

**drop-in.** (ISO) In the *storage and retrieval* of *data* from a *magnetic storage device*, an error revealed by the *reading* of a *binary character* not previously recorded, and usually caused by defects or the presence of particles in the magnetic surface layer.

**drop-out.** (ISO) In the *storage and retrieval* of *data* from a *magnetic storage device*, an error due to the failure to *read* a *binary character*, and usually caused by defects or the presence of particles in the magnetic surface layer.

**drum.** See *magnetic drum*.

**drum plotter.** (ISO) A *plotter* that draws a *display image* on a *display surface* mounted on a rotating drum.

**drum printer.** (ISO) An *impact printer* in which a full *character set*, placed on a rotating drum, is made available for each *printing position*.

**drum storage.** See *magnetic drum storage*.

**DSE.** *Data switching exchange*.

**DTE.** *Data terminal equipment*.

**dual-media typewriter.** (1) A *typewriter* that uses two different recording materials for recording, manipulating, *storing*, and printing out *information*. (2) See *electric typewriter*.

**dual operation.** (ISO) Of a *Boolean operation*, another *Boolean operation* whose result, when performed on *operands* that are the *negation* of the operands of the first *Boolean operation*, is the negation of the result of the first *Boolean operation*; for example, *disjunction* is the dual operation of *conjunction*.



**dual-pitch printer.** A *printer* that can print two or more *type sizes* using different *character spacing*.

**dummy.** Pertaining to the characteristic of having the appearance of a specified thing but not having the capacity to function as such; for example, a *dummy character*, a *dummy plug*, or a *dummy statement*.

**dummy instruction.** (ISO) An item of *data* in the form of an *instruction* that is inserted into a *sequence* of instructions, but that is not intended to be *executed*.

**dump.** (1) (ISO) *Data* that have been dumped. (2) (ISO) To *write* at a particular instant the contents of *storage* onto another *data medium* for the purpose of safeguarding the *data*. (3) See *change dump*, *checkpoint dump*, *disaster dump*, *postmortem dump*, *snapshot dump*.

**duodecimal.** (1) (ISO) Pertaining to a selection, choice or condition that has twelve possible different values or states. (2) (ISO) Pertaining to a *fixed radix numeration system* having a *radix* of twelve.

**duplex transmission.** (ISO) *Data transmission* in both directions at the same time.

**duplicate.** To make an identical copy of an existing *document*.

**duplication check.** A *check* based on the consistency of the results of two independent performances of the same task.

**dyadic Boolean operation.** (ISO) A *Boolean operation* on two and only two *operands*.

**dyadic operation.** (ISO) An *operation* on two and only two *operands*.

**dyadic operator.** (ISO) An *operator* that represents an *operation* on two and only two *operands*.

**dynamic.** In *programming languages*, pertaining to properties that can be established only during the *execution* of a *program*.

**dynamic buffering.** (ISO) A *dynamic allocation* of *buffer storage*.

**dynamic image.** (ISO) Synonym for *foreground image*.

**dynamicizer.** (ISO) Synonym for *serializer*.

**dynamic programming.** In *operations research*, a procedure for optimization of a multistage problem solution wherein a number of decisions are available at each stage of the *process*.

**dynamic relocation.** (ISO) A *process* that assigns new *absolute addresses* to a *computer program* during *execution* so that the program may be executed from a different area of *main storage*.

**dynamic resource allocation.** (ISO) An allocation technique in which the *resources* assigned for the *execution* of *computer programs* are determined by criteria applied at the moment of need.

**dynamic storage.** (1) (ISO) A *storage device* that *stores* and *retrieves data* on a moving *data medium*. (2) (ISO) A *storage device* that requires periodic refreshment for retention of *data*.

**dynamic subroutine.** A *subroutine* in which *parameters* may be selected or adjusted in accordance with processing requirements.

# E

**EAM.** *Electrical accounting machine.*

**EBCDIC.** The *extended binary-coded decimal interchange code*.

**EBR.** *Electron beam recording.*

**echo.** (1) In *text processing*, to print or *display characters* or lines as they are entered on a keyboard. (2) (ISO) In *computer graphics*, the immediate notification of the current values provided by an *input device* to the operator at the *display console*.

**echo check.** (ISO) A *check* to determine the correctness of the *transmission of data* in which the received data are returned to the source for comparison with the originally transmitted data. Synonymous with *loop check*.

**edge.** See *reference edge*, *stroke edge*.

**edge-coated card.** A card that has been strengthened by treating one or more edges.

**edit.** (ISO) To prepare *data* for a later operation. Editing may include the rearrangement or the addition of data, the *deletion* of unwanted data, *format control*, *code conversion*, and the application of standard processes such as *zero suppression*.

**editing.** (1) In *programming languages*, the transformation of values to their representations specified by a given *format*. (2) See *text editing*.

**editing symbols.** In *micrographics*, *symbols on microfilm* that are readable without magnification, and that provide cutting, loading, and other preparation instructions.

**editor.** (1) In *text processing*, a *program* or device used to enter, rearrange, modify, or *delete text* in a document. (2) See *linkage editor*, *stream editor*.

**editor program.** A *computer program* that is designed to perform such *functions* as the rearrangement, modification, and *deletion of data* in accordance with prescribed rules.

**effective address.** The *address* that is derived by applying any specified *indexing* or *indirect addressing rules* to the specified address, and that is actually used to identify the current *operand*.

**effective data transfer rate.** (ISO) The average number of *bits*, *characters*, or *blocks* per unit of time transferred from a *data source* to a *data sink* and accepted as valid.

**effective instruction.** An *instruction* that may be executed without modification.

**effective transfer rate.** (ISO) The actual number of *binary characters of user data* that are transferred per unit of time.

**eight-bit byte.** (ISO) Synonym for *octet*.

**eject key.** (ISO) In *text processing*, a control that releases or moves the *recording medium* to a position for easy removal from the equipment.

**electrical accounting machines (EAM).** *Data processing equipment* that is predominantly electromechanical; for example, *keypunches*, mechanical sorters, *collators*, and *tabulators*.

**electric typewriter.** A *typewriter* operated mechanically with electrical assistance.

**electromagnetic delay line.** A *delay line* whose operation is based on the time of propagation of electromagnetic waves through distributed or lumped capacitance and inductance.

**electron beam recording (EBR).** In *micrographics*, a specific method of *computer output microfilming* in which a beam of electrons is directed onto an energy-sensitive *microfilm*.

**electronic mail.** The use of a *computer* to transmit correspondence between *workstations*.

**electronic publishing.** Synonym for *computer-aided publishing*.

**electrostatic plotter.** (ISO) A *raster plotter* that uses a row of electrodes to fix the ink electrostatically on the paper.

**electrostatic printer.** (ISO) A *nonimpact printer* that electronically creates images on a coated printing medium or that creates energized patterns that are made visible by a toner, and fixed; in some instances an electrostatic printer may be used as a *plotter*.

**electrostatic storage.** (ISO) A *storage device* that uses electrically charged areas on a dielectric surface layer.

**element.** See *AND element*, *combinational gate*, *data element*, *derived data element*, *display element*, *sequential gate*, *threshold element*.

**elementary action.** In a *conceptual schema language*, the *insertion*, *deletion*, or *retrieval* of a sentence.

**elementary command.** In a *conceptual schema language*, the order or trigger for an *elementary action* to take place.

**element string.** See *binary element string*.

**eleven punch.** A *punch* in the second row from the top, on a *Hollerith card*. Synonymous with *x punch*.

**EM.** The *end-of-medium character*.

**embedded command.** A *text processing instruction* entered as part of the *text*; it normally is not displayed

or printed on *output* and usually acts on all subsequent applicable text encountered by the *text processor*.

**embedded hyphen.** (ISO) Synonym for *hard hyphen*.

**embedded system.** A system that is a part of a larger system whose primary purpose is not computational; for example, a *computer system* in a satellite or *process control system*.

**embossed character.** A *character* raised in relief from the surface of a medium such as a credit card. Contrast with *debossed character*.

**embossment.** (1) A distortion of the surface of a *document*. (2) In *character recognition*, the distance between the undistorted surface of a *document* and a specified part of a printed *character*.

**emergency maintenance.** *Maintenance* specifically intended to eliminate an existing *fault* that makes continued production work unachievable.

**emergency maintenance time.** Time, usually unscheduled, used to perform *emergency maintenance*.

**empty medium.** (ISO) A *data medium* that contains only marks of reference and no *user data*.

**emulate.** (1) (ISO) To imitate one system with another, primarily by *hardware*, so that the imitating system accepts the same *data*, executes the same *computer programs*, and achieves the same result as the imitated system. (2) Contrast with *simulate*.

**emulation.** (1) (ISO) The imitation of all or part of one system by another, primarily by *hardware*, so that the imitating system accepts the same *data*, executes the same *computer programs*, and achieves the same results as the imitated system. (2) Contrast with *simulation*.

**enabling signal.** (ISO) A *signal* that permits the occurrence of an event.

**encode.** (ISO) To convert *data* by the use of a code or a coded *character set* in such a manner that reconversion to the original form is possible.

**encoder.** (ISO) A *functional unit* that has a number of *input lines* such that not more than one at a time may carry a *signal*, and a number of *output lines* such that any number may carry signals; the combination of *output signals* serves as the code that indicates which *input line* carries the signal.

**end-around borrow.** (ISO) The action of transferring a *borrow digit* from the most significant *digit place* to the least significant *digit place*.

**end-around carry.** (ISO) The action of transferring a *carry digit* from the most significant *digit place* to the least significant *digit place*. An end-around carry may be necessary when adding two negative *numbers* that

are represented by their *diminished radix complements*.

**end-around shift.** (ISO) A *logical shift* in which the *characters* moved out of one end of a *computer word* or *register* are re-entered into the other end. Synonymous with *cyclic shift*.

**ending-frame delimiter.** (ISO) A specified *bit pattern* that indicates the end of a *transmission frame*.

**end-of-file label.** (ISO) An *internal label* that indicates the end of a *file* and that may contain *data* for use in *file control*. Synonymous with *trailer label*.

**end-of-medium character (EM).** (ISO) A *control character* that may be used to identify the physical end of the *data medium*, the end of the used portion of the medium, or the end of the wanted portion of the *data* recorded on the medium.

**end-of-tape marker (EOT).** (ISO) A marker on a *magnetic tape* used to indicate the end of the permissible recording area; for example, a photo-reflective strip, or a transparent section of tape.

**end-of-text character (ETX).** (ISO) A *transmission control character* used to terminate *text*.

**end-of-transmission-block character (ETB).** (ISO) A *transmission control character* used to indicate the end of a *transmission block* of *data* when *data* are divided into such blocks for *transmission* purposes.

**end-of-transmission character (EOT).** (ISO) A *transmission control character* used to indicate the conclusion of a *transmission* which may have included one or more *texts* and any associated *message headings*.

**end-of-volume label (EOV).** (ISO) An *internal label* that indicates the end of the *data* contained in a volume.

**endpoint node.** (ISO) A *node* that is at the end of a *branch*. Synonymous with *peripheral node*.

**end user.** (1) A person, device, *program*, or *computer system* that uses an *information system* for the purpose of *data processing* and *information exchange*. (2) A person whose occupation requires the use of an *information system* but does not require any knowledge of *computers* or *computer programming*.

**end-user language.** A *language* intended for purposes of *information processing* by *end users*.

**ENQ.** The *enquiry character*.

**enquiry character (ENQ).** (ISO) A *transmission control character* used as a request for a response from the station with which the *connection* has been set up; the response may include station identification, the type of equipment in service, and the status of the *remote station*.



**entity.** (1) Anything, such as a person, place, *process*, object, concept, *association*, or event. (2) Anything about which *information* is stored in a *database*. (3) In a *conceptual schema language*, any concrete or abstract thing of interest, including *associations* among things.

**entity-integrity property.** In a *relation*, the property that precludes a *null* value for any *primary key* or component of a *primary key*.

**entity-relationship data model.** A *data model* based on the concept of *entities* and *relationships* among entities, and of the *attributes* of entities and *relationships*.

**entity set.** A collection of similar *entities*, that is, entities that have the same *attributes*.

**entity type.** In a *conceptual schema language*, the *proposition* that establishes that an *entity* is a member of a particular *class* of entities, implying as well that there is such a *class* of entities. See also *attribute type*, *relationship type*.

**entity world.** In a *conceptual schema language*, a possible collection of *entities* that may be perceived together.

**entry.** (1) In a *programming language*, a *language construct* within a *procedure* that designates the *statement* that starts the *execution* of the *procedure*. (2) See *remote batch entry*, *remote job entry*.

**entry conditions.** The initial *data* and control conditions to be satisfied for successful *execution* of a given *routine*.

**entry point.** (1) In a *routine*, any place to which control can be passed. (2) The *stored record* that is *accessed* by the *user's* first *command* upon initial entry into a *file*.

**environment.** (1) Everything that *supports* a *system* or the performance of a *function*. (2) The conditions that affect the performance of a *system* or *function*. (3) In a *conceptual schema language*, that part of the real world that contains the *users* that exchange *messages* with an *information system*.

**environmental loss time.** (ISO) *Down time* due to a *fault* outside the *functional unit*. Synonymous with external loss time.

**environmental requirement.** (ISO) Any of the physical conditions required for the protection and proper operation of a *functional unit*; the requirement is usually specified as a nominal value and a tolerance range. For a device, there may be more than one set of environmental requirements; for example, one set for transport, another for storage, and another for operation.

**EOF.** The *end-of-file* label.

**EOT.** (1) The *end-of-transmission* character. (2) The *end-of-tape* marker.

**EOV.** The *end-of-volume* label.

**EPROM.** *Erasable programmable read-only memory*.

**equals function.** (ISO) In a *calculator*, the *function* that completes a series of *operations* and provides the result.

**equivalence.** A *logic operator* that has the property that if P is a statement, Q is a statement, R is a statement, then the equivalence of P,Q,R is true if and only if all statements are true or all statements are false.

**equivalence operation.** (ISO) The *dyadic Boolean operation* whose result has the Boolean value 1 if and only if the *operands* have the same Boolean value. Synonymous with IF-AND-ONLY-IF operation.

**equivalent-binary-digit factor.** The average number of *binary digits* required to express one *radix digit* in a non-binary *numeration system*; for example, approximately 3.33 times as many *digits* are required to express a *binary numeral* as to express the equivalent *decimal numeral*.

**erasable programmable read-only memory (EPROM).** (ISO) A *programmable read-only memory* that can be erased by a special *process* and re-used. Synonymous with reprogrammable read-only memory.

**erasable storage.** (ISO) A *storage device* onto which different *data* can be written at the same *storage location*.

**erase.** (ISO) To remove *data* from a *data medium*, leaving the medium available for recording new data.

**erase head.** (ISO) Any *electromagnetic transducer* used to apply on *magnetic media* alternative or continuous fields required to erase the recording. Synonymous with erasing head.

**erasing head.** (ISO) Synonym for *erase head*.

**erasure current.** The *write current* necessary to reduce previously recorded *data* on a *magnetic surface* to 1 per cent or less of its maximum amplitude.

**error.** (1) (ISO) A discrepancy between a computed, observed, or measured value or condition and the true, specified, or theoretically correct value or condition. (2) See *absolute error*, *balanced error*, *bias error*, *inherited error*, *relative error*, *rounding error*, *truncation error*.

**error burst.** In *data communication*, a sequence of *signals* containing one or more *errors* but counted only as one unit in accordance with some specific criterion or measure; for example, if three consecutive correct *bits* follow an erroneous bit, then an error burst is terminated.

**error control.** (ISO) That part of a *protocol* that controls the *detection*, and possibly, the *correction* of *errors*.

**error control character.** Synonym for *accuracy control character*.

**error control software.** (ISO) *Software* that monitors a *computer system* to detect, record, and possibly to correct errors.

**error-correcting code.** (ISO) A *code* in which each *character* or *signal* conforms to specific rules of construction, so that deviations from these rules indicate the presence of an *error* and in which some or all of the detected errors can be corrected *automatically*.

**error-detecting code.** (ISO) A *code* in which each *character* or *signal* conforms to specific rules of construction, so that any deviation from these rules indicates the presence of an *error*. Synonymous with self-checking code.

**error indication.** (ISO) On a *calculator*, a visual indication that the *user* has attempted to carry out a *function* that the calculator cannot perform.

**error message.** An indication that an *error* has been detected.

**error range.** (ISO) The set of values that an *error* may take.

**error ratio.** (1) The ratio of the number of *data* units in *error* to the total number of *data* units. (2) See *residual error ratio*.

**error recovery.** (ISO) The *process* of correcting or bypassing the effects of a *fault* to restore a *computer system* to a prescribed condition.

**error span.** (ISO) The difference between the highest and the lowest *error* values.

**ESC.** The *escape character*.

**escape character (ESC).** (1) (ISO) A *code extension character* used, in some cases with one or more succeeding *characters*, to indicate by some convention or agreement that the *coded representations* following the character or the group of characters are to be interpreted according to a different code or according to a different *coded character set*. (2) See *data link escape character*.

**escapement.** The relative movement by one increment between the printing medium and the *printing position*.

**ETB.** The *end-of-transmission-block* character.

**ETX.** The *end-of-text* character.

**evaluation report.** (ISO) A *system-followup* report that describes how the *system objectives* have been met,

identifies the remaining problems, and assists future development.

**event.** (1) An occurrence or happening that is significant to the performance of a *function*, *operation* or *task*. (2) In a *conceptual schema language*, an occurrence in the *universe of discourse*, in the *environment*, or in the *information system*. (3) See *external event*, *internal event*.

**event posting.** The saving of the *computer program* and the *data* context of a *task*, and establishing the program and data of another task to which control is to be passed, based on an event such as completion of *loading* of data into *main storage*.

**exception.** (ISO) In *programming languages*, a special situation that may arise during *execution* that is considered abnormal, and that may cause a deviation from the normal *sequence* of execution, and for which facilities exist for defining, preventing, recognizing, and handling such situations.

**excess-three code.** (ISO) The *binary-coded decimal notation* in which a *decimal digit* *n* is represented by the *binary numeral* that represents *n* + 3.

**exchange processing.** (ISO) In *credit card processing*, the rules that govern the transmission of *information* between a sending and a receiving machine.

**exchange sort.** A *sort* in which succeeding pairs of *items* in a *set* are examined; if the items in a pair are out of *sequence* according to the specified criteria, the positions of the items are exchanged; for example, a *bubble sort*. This *process* is repeated until all items are sorted.

**exclusion.** (1) (ISO) The *dyadic Boolean operation* whose result has the Boolean value 1 if and only if the first *operand* has the Boolean value 1 and the second has the Boolean value 0. (2) A *logic operator* having the property that if *P* is a statement and *Q* is a statement, then *P* exclusion *Q* is true if *P* is true and *Q* is false, false if *P* is false, and false if both statements are true. *P* exclusion *Q* is often represented by a combination of AND and NOT symbols, such as  $P \sim \wedge Q$ . (3) Synonymous with NOT-IF-THEN operation.

**exclusive lock.** The situation that prevails when one application *program* is granted exclusive access to *records* and all the other application programs must wait until the first program releases the *lock*.

**exclusive-OR.** (1) A logic operator having the property that if *P* is a statement and *Q* is a statement; then *P* exclusive-OR *Q* is true if either but not both statements are true, false if both are true or both are false. *P* exclusive-OR *Q* is often represented by  $P \vee Q$ ,  $P \vee \vee Q$  (2) Contrast with *OR*.

**exclusive-OR element.** (ISO) Synonym for *exclusive-OR gate*.



**exclusive-OR gate.** (ISO) A *gate* that performs the Boolean operation of *nonequivalence*. Synonymous with exclusive-OR element.

**exclusive-OR operation.** (ISO) Synonym for *nonequivalence operation*.

**execute.** (ISO) To perform the actions specified by a *program* or portion of a *program*.

**execution.** (ISO) The *process* of carrying out an *instruction* or the *instructions* of a *computer program* by a *computer*.

**execution time.** (1) Any instant at which a *computer program* is being *executed*. (2) The amount of time needed for the processing of a particular *computer program*. (3) Synonymous with *run time*.

**executive program.** Synonym for *supervisory program*.

**executive routine.** Synonym for *supervisory routine*.

**exit.** (1) (ISO) To *execute* an *instruction* or *statement* within a portion of a *program* in order to terminate the execution of that portion. Such portions may include *loops*, *routines*, *subroutines*, *modules*. (2) (ISO) Any *instruction* in a *computer program*, in a *routine*, or in a *subroutine* after the *execution* of which control is no longer exercised by that *computer program*, that *routine*, or that *subroutine*.

**expand.** (ISO) To return *compressed data* to their original form.

**expert system.** In *artificial intelligence*, a *functional unit* for solving problems in a particular field of knowledge by drawing inferences from a *knowledge base* acquired through human experience. Synonymous with *knowledge-based system*.

**expiration check.** (ISO) A comparison of a given date with an expiration date associated with a *transaction*, a *record*, or a *file*. Synonymous with *retention period check*.

**explosion proof.** (ISO) Pertaining to equipment that will neither explode nor cause an explosion.

**exponent.** (ISO) In a *floating-point representation*, the *numeral* that denotes the power to which the implicit *floating point base* is raised before being multiplied by the *fixed-point part* to determine the *real number* represented; for example, a floating point representation of the number 0.0001234 is 0.1234-3, where 0.1234 is the fixed-point part and -3 is the exponent.

**export/import.** (1) The *transfer* and conversion of *data* from one *program* to another. (2) In an *information resource dictionary system*, pertaining to the set of *commands*, *controls*, and other procedural elements necessary to move the contents of one *information resource dictionary* to another.

**expression.** (1) A *language construct* that is composed of various *operations* and *operands* and that may yield a value or set of values. (2) A configuration of signs.

**extended binary-coded decimal interchange code.** A *coded character set* that consists of 8-bit coded *characters*.

**extended result output function.** (ISO) In a *calculator*, the *function* that allows the *displaying* or *printing* of the result of a calculation in successive *operations* where the number of *digits* in the result exceeds the *output capability* of the calculator.

**extended time scale.** The time scale used in *data processing* when the *time scale factor* is greater than one. Synonymous with *slow time scale*.

**extensibility.** See *information resource dictionary extensibility*, *information resource dictionary system extensibility*.

**extension character.** See *code extension character*.

**external.** In a *programming language*, pertaining to a *language construct* that has a scope extending beyond one *module*.

**external delay.** Time lost due to circumstances beyond the control of the *operator* or *maintenance engineer*; for example, failure of an external power source.

**external event.** In a *conceptual schema language*, an *event* that occurs in the *environment* or in the *universe of discourse*. Contrast with *internal event*.

**external label.** (ISO) A *label*, usually not machine-readable, that is attached to a *data medium* container; for example, a paper sticker attached to the outside of a *magnetic tape reel*.

**external level.** In a *conceptual schema language*, all aspects dealing with the *user-oriented* representation of *information* visible at the outer *interfaces* of an *information system*. Contrast with *internal level*.

**external loss time.** (ISO) Synonym for *environmental loss time*.

**external program parameter.** (ISO) In a *computer program*, a *parameter* that must be bound during the *calling* of the program.

**external schema.** (1) A logical description of an enterprise that may differ from the *conceptual schema* upon which it is based in that some *entities*, *attributes*, or *relationships* may be omitted, renamed, or otherwise transformed. (2) In a *conceptual schema language*, the definition of the external representation forms for the possible collections of *sentences* within the scope of a particular *user's* view, including the manipulation aspects of these forms. (3) Contrast with *internal schema*.



**external sort.** (1) A *sort* that requires the use of *auxiliary storage* because the *set of items* to be sorted cannot be held in the available *internal storage* at one time. (2) A *sort program*, or a sort phase of a *multi-pass sort*, that *merges strings of items*, using *auxiliary storage*, until one string is formed.

**external storage.** (ISO) Synonym for *auxiliary storage*.

**extract.** To select and remove from a *set of items* those items that meet some criteria; for example, to obtain certain specified *digits* from a *computer word* as controlled by an *instruction* or a *mask*.

## F

**face change character.** (ISO) Synonym for *font change character*.

**factor.** See *equivalent-binary-digit factor*, *relocation factor*, *scale factor*, *time scale factor*.

**factorial.** (ISO) The product of the *natural numbers* 1, 2, 3, up to and including a given *integer*.

**factorial function.** (ISO) In a *calculator*, the *function* that computes *factorials*.

**fallsafe operation.** (ISO) The *operation* of a *computer system* so that in case of *failure* of a component, there is no loss of equipment, damage to equipment, or harm to personnel.

**failsoft.** (ISO) Pertaining to a *computer system* that continues to function because of its fault tolerance.

**failure.** (1) The temporary or permanent termination of the ability of a *functional unit* to perform its required *function*. Synonymous with *malfunction*. (2) See *mean time between failures*.

**false add.** To form a partial sum, that is, to add without *carries*.

**fanfold paper.** (ISO) *Continuous forms* previously folded as a fan and usually fed by means of feed holes on each side. Synonymous with *z-fold paper*, *zig-zag fold paper*.

**fast select.** (ISO) An option of a *virtual call facility* that allows the inclusion of *data* in the *call* setup and call clearing *packets*.

**fast time scale.** The time scale used in *data processing* when the *time scale factor* is less than one.

**fatal error.** (ISO) An *error* that causes further *execution* to be meaningless.

**fault.** (1) An accidental condition that causes a *functional unit* to fail to perform its required *function*. (2) See *program-sensitive fault*.

**fault-rate threshold.** (ISO) A *fault threshold* expressed in terms of the number of *faults* in a prescribed period of time.

**fault threshold.** (ISO) A prescribed limit to the number of *faults* in a specified category that, if exceeded, requires a remedial action. The remedial action may include notifying the operators, running *diagnostic programs*, or reconfiguration to exclude a faulty unit.

**fault trace.** (ISO) A record of *faults* obtained by a *monitor* that reflects the *sequence* of states that immediately preceded the occurrence of the faults.

**FC.** A *font change character*.

**FE.** A *format effector character*.

**feasibility study.** (ISO) A study to identify and analyze a problem and its potential solutions in order to determine their viability, costs, and benefits.

**feedback loop.** The components and processes involved in correcting or controlling a system by using part of the output as *input*.

**feed hole.** (ISO) A hole punched in a *data medium* to enable it to be positioned. Synonymous with *sprocket hole*.

**feed pitch.** (ISO) The distance between corresponding points of adjacent feed holes along the *feed track*.

**feed punch.** See *automatic-feed punch*.

**feed track.** (ISO) A *track* of a *data medium* that contains the *feed holes*. Synonymous with *sprocket track*.

**ferrite.** An iron compound frequently used in the construction of *magnetic cores*.

**fetch.** To locate and load a quantity of *data* from *storage*.

**FF.** The *form feed character*.

**fibonacci number.** An *integer* in the *fibonacci series*.

**fibonacci search.** (ISO) A *dichotomizing search* in which the number of *data elements* in a set is equal to a *fibonacci number* or is assumed to be equal to the next higher fibonacci number, and then at each step in the search the set of elements is partitioned in accordance with the *fibonacci series*. A fibonacci search has an advantage over a *binary search* in slightly reducing average movement of a *sequentially accessed data medium* such as a *magnetic tape*.

**fibonacci series.** A series of *integers* in which each integer is equal to the sum of the two preceding integers in the series. The series is formulated mathematically by  $X_i = X_{i-1} + X_{i-2}$ , where  $X_0 = 0$  and  $X_1 = 1$  that is, 0, 1, 1, 2, 3, 5, 8, 13, 21....

**field.** (1) (ISO) On a *data medium* or in *storage*, a specified area used for a particular class of *data*; for example, a group of *character positions* used to enter or display wage rates on a screen. (2) Defined logical *data* that is part of a *record*. (3) The elementary unit of a *record* that may contain a *data item*, a *data aggregate*, a *pointer*, or a *link*. (4) See *card field*, *common field*.

**field-programmable read-only storage.** A *read-only storage* that, after being manufactured, can have the *data content* of each *storage cell* altered.

**FIFO.** *First-in-first-out*.

**figurative constant.** (ISO) A *data name* that is reserved for a specified *constant* in a specified *programming language*.

**file.** (1) (ISO) A set of related records treated as a unit; for example, in stock control, a file could consist of a set of invoices. (2) The largest unit of storage structure that consists of a named collection of all occurrences in a database of records of a particular record type. (3) In the CODASYL model, synonym for area. (4) See backup file, flat file, inverted file, job recovery control file, sequential file, serial file, transaction file.

**file clean-up.** (ISO) The removal of superfluous or obsolete data from a file.

**file gap.** An area on a data medium intended to be used to indicate the end of a file, and possibly, the start of another. A file gap is frequently used for other purposes, in particular, as a flag to indicate the end or beginning of some other group of data.

**file layout.** (ISO) The arrangement and structure of data or words in a file, including the order and size of the components of the file.

**file maintenance.** The activity of keeping a file up to date by adding, changing, or deleting data.

**file organization.** The physical order of records in a file, as determined by the access method used to store and retrieve them.

**file-protection ring.** (ISO) A removable plastic or metal ring, the presence or absence of which on a magnetic tape prevents writing on the magnetic tape and thereby prevents the accidental erasure of the file. Synonymous with file protect ring, safety ring.

**file protect ring.** (ISO) Synonym for file-protection ring.

**file separator character (FS).** (ISO) The information separator intended to identify logical boundaries between fields, files, and other elements of a data structure.

**filler.** (ISO) One or more characters that are used to bring the representation of a data item up to a specified size.

**filler character.** A specific character or bit combination used to fill the remainder of a field after justification.

**film storage.** See magnetic thin film storage.

**filter.** A device or program that separates data, signals, or material in accordance with specified criteria.

**firmware.** Microcode stored in ROM.

**first-in-first-out (FIFO).** A queuing technique in which the next item to be retrieved is the item that has been in the queue for the longest time.

**first-line find.** (ISO) In text processing, the capability of a device to advance to a predetermined writing line

on the next sheet of continuous forms paper where printing is to begin. Synonymous with head of form, top of form, vertical form skip control.

**five-bit byte.** (ISO) Synonym for quintet.

**fixed-cycle operation.** An operation that is completed in a specified number of regularly timed execution cycles.

**fixed-decimal mode.** (ISO) In calculators, a mode in which the number of decimal places to be shown in the result of a calculation is shown.

**fixed disk.** Synonym for nonremovable disk.

**fixed-function generator.** (ISO) A function generator in which the function it generates is set by construction and cannot be altered by the user.

**fixed pitch.** Synonym for monospacing.

**fixed-point part.** (ISO) In a floating-point representation, the numeral that is multiplied by the exponentiated implicit floating-point base to determine the real number represented; for example, a floating-point representation of the number 0.0001234 is 0.1234-3, where .1234 is the fixed-point part and -3 is the exponent. Synonymous with mantissa (2).

**fixed-point register.** (ISO) A register used to manipulate data in a fixed-point representation system.

**fixed-point representation system.** (ISO) A radix numeration system in which the radix point is implicitly fixed in the series of digit places by some convention upon which agreement has been reached.

**fixed-program read-only storage.** A read-only storage in which the data content of each storage cell is determined during manufacture and is thereafter unalterable.

**fixed-radix notation.** (ISO) Synonym for fixed-radix numeration system.

**fixed-radix numeration system.** (ISO) A radix numeration system in which all the digit places, except perhaps the one with the highest weight, have the same radix. The weights of successive digit places are successive integral powers of a single radix, each multiplied by the same factor. Negative integral powers of the radix are used in the representation of fractions. A fixed-radix numeration system is a particular case of a mixed-radix numeration system. Synonymous with fixed-radix notation.

**fixed storage.** (ISO) Synonym for read-only storage.

**flag.** (1) (ISO) An indicator or parameter that shows the setting of a switch. Synonymous with switch indicator. (2) Any of the various indicators used for identification purposes; for example, a word mark. (3) A character that signals the occurrence of some condi-



tion, such as the end of a word. (4) Synonymous with sentinel.

**flag register.** (ISO) A special purpose register in which bits are set according to specified conditions that may occur during the execution of instructions.

**flash.** See *form flash*.

**flash card.** (ISO) In micrographics, a target printed with distinctive markings that is photographed to facilitate the indexing of microfilm.

**flatbed plotter.** (ISO) A plotter that draws a display image on a display surface mounted on a flat surface.

**flat file.** (1) A one-dimensional or two-dimensional array; that is, list or a table. (2) A collection of records that contain no data aggregates, and no nested repeating groups of data items.

**flexible disk.** (ISO) A flexible magnetic disk enclosed in a protective container. Synonymous with floppy disk.

**flicker.** (ISO) An undesirable pulsation of a display image on a cathode ray tube; the pulsation occurs when the regeneration rate is too low with respect to the phosphor characteristics.

**flip-flop.** (ISO) Synonym for *bistable trigger circuit*.

**floating decimal mode.** (ISO) A mode in which the decimal marker is automatically positioned in the result of a calculation irrespective of the mode in which the input data are entered.

**floating head.** (ISO) A magnetic head floating on a layer of air away from the recording surface. Synonymous with air-floating head, flying head.

**floating-point base.** (ISO) In a floating-point representation system, the implicit fixed positive integer base, greater than unity, that is raised to the power explicitly denoted by the exponent in the floating-point representation or represented by the characteristic in the floating-point representation and then multiplied by the fixed-point part to determine the real number represented.

**floating-point register.** (ISO) A register used to manipulate data in a floating point representation system.

**floating-point representation system.** (ISO) A numeration system in which a real number is represented by a pair of distinct numerals, the real number being the product of the fixed-point part, one of the numerals, and a value obtained by raising the implicit floating-point base to a power denoted by the exponent in the floating-point representation, indicated by the second numeral.

**floppy disk.** (ISO) Synonym for *flexible disk*.

**flow.** See *bidirectional flow*, *normal direction flow*, *reverse direction flow*.

**flow analysis.** (1) In compilers, a technique used to determine the specific interdependencies of the elements of a computer program. (2) The detection and recording of the sequencing of instructions in computer programs, as used, for example, in monitors and debugging routines.

**flowchart.** (ISO) A graphical representation in which symbols are used to represent such things as operations, data, flow direction, and equipment, for the definition, analysis, or solution of a problem. Synonymous with flow diagram.

**flowchart symbol.** (ISO) A symbol used to represent operations, data, flow direction, or equipment on a flowchart.

**flowchart text.** The descriptive information that is associated with flowchart symbols.

**flow control.** (ISO) In data communication, the procedure for controlling the data transfer rate.

**flow diagram.** (ISO) Synonym for *flowchart*.

**flow direction.** (ISO) On a flowchart, the indicators of the antecedent-to-successor relations among the symbols.

**flowline.** (ISO) A line representing a connection or path between the symbols in a flowchart to indicate a transfer of data or control.

**fluorics.** The area within the field of fluidics in which components and systems perform functions such as sensing, logic, amplification, and control without the use of mechanical parts.

**fluidic.** Pertaining to the sensing, control, information processing, and actuation functions performed through the use of fluid dynamic phenomena.

**fluidics.** That branch of science and technology concerned with sensing, control, information processing, and actuation functions performed through the use of fluid dynamic phenomena.

**flying head.** (ISO) Synonym for *floating head*.

**flying spot scanner.** In optical character recognition, a device that uses a moving spot of light to scan a sample space, the intensity of the transmitted or reflected light being sensed by a photoelectric transducer.

**fold.** To compact data by combining parts of the data; for example, to transform a two-word alphabetic key into a one-word numeric key by adding numeric equivalents of the letters.

**follower.** See *curve follower*.

**font.** A family or assortment of *characters* of a given size and style; for example, 9-point Bodoni modern.

**font change character (FC).** (ISO) A *control character* that selects and makes effective a change in the specific shape or size, or shape and size of the *graphics* for a set of graphemes, the *character set* remaining unchanged. Synonymous with face change character.

**forbidden combination.** A combination of *bits* or other representations that is not valid according to some criterion.

**foreground image.** (ISO) That part of a *display image*, such as a *forms overlay*, that can be changed for every *transaction*. Synonymous with dynamic image.

**foreground processing.** (ISO) The execution of a *computer program* that preempts the use of *computer facilities*.

**foreign key.** In a *relation*, a *column* whose *data values* correspond to the values of a *key column* in another relation.

**formal logic.** (ISO) The study of the structure and form of valid *argument* without regard to the meaning of the terms in the argument.

**formal parameter.** A *language object* whose *identifier* appears in a *procedure* and that is associated with the corresponding *actual parameter* provided by each execution of the *procedure call*.

**format.** (1) (ISO) The arrangement or layout of *data* in or on a *data medium*. (2) In a *programming language*, a *language construct* that specifies the rules for transformation between internal and *character* representations of *data objects*. (3) In *text processing*, an arrangement or layout of *text*. (4) See *address format*, *instruction format*.

**format check.** (ISO) A *check* to determine whether *data* conform to a specified layout.

**format effector (FE).** (ISO) Any *control character* used to control the positioning of printed, *displayed*, or recorded *data*. Synonymous with layout character.

**formatted information.** An arrangement of *information* into *discrete* units and structures in a manner that facilitates its *access* and *processing*. Contrast with *narrative information*.

**form feed.** (1) (ISO) The movement of the printing or *display* position to the predetermined first line on the next form, the next *page*, or the equivalent. (2) (ISO) A *paper skip* used to bring an assigned part of a form to the *printing position*.

**form feed character (FF).** (ISO) A *format effector* that causes the printing or *display* position to move to the next predetermined first line on the next form, the next *page*, or the equivalent.

**form flash.** (ISO) The *display* of a *form overlay*.

**form overlay.** (ISO) A pattern such as a report form, grid, or map used as a *background image*.

**formula manipulation.** The algebraic manipulation of mathematical formulas.

**FORTRAN (formula translation).** A *programming language* primarily used to express *computer programs* by arithmetic formulas.

**forward channel.** (ISO) A *channel* in which the direction of *transmission* coincides with that in which *user information* is being transferred.

**forward recovery.** (ISO) The reconstruction of a newer version of a *file* by updating an earlier version with *data* recorded in a *journal*.

**four-bit byte.** (ISO) Synonym for *quartet*.

**frame.** (ISO) See *transmission frame*.

**frequency modulation recording.** FM recording.

**frequency shift keying (FSK).** (ISO) *Frequency modulation* of a carrier by a modulating *signal* that varies between a fixed number of *discrete* values, that is, a *digital signal*.

**front-end processor.** (ISO) In a *computer network*, a processor that relieves a *host computer* of processing tasks such as line control, message handling, code conversion, and error control.

**FS.** The *file separator character*.

**FSK.** *Frequency shift keying*.

**full adder.** (1) (ISO) A *combinational circuit* that has three *inputs* that are an augend, D, an addend, E, and a *carry digit* transferred from another *digit place*, F; and two *outputs* that are a sum without carry, T, and a new carry digit, R, and in which the outputs are related to the inputs according to the table below. (2) See Figure 8.

**full subtracter.** (1) (ISO) A *combinational circuit* that has three *inputs* that are a minuend, I, a subtrahend, J, and a *borrow digit*, K, transferred from another *operation*; and two *outputs* that are a difference without carry, W, between the first *digit* and the sum of the second digit and the borrow digit, and a new borrow digit, X, and in which the outputs are related to the inputs according to the table below. (2) See Figure 9.

Input D augend	0	0	1	1	0	0	1	1
Input E addend	0	1	0	1	0	1	0	1
Input F carry digit	0	0	0	0	1	1	1	1
Output T sum without carry	0	1	1	0	1	0	0	1
Output R carry digit	0	0	0	1	0	1	1	1

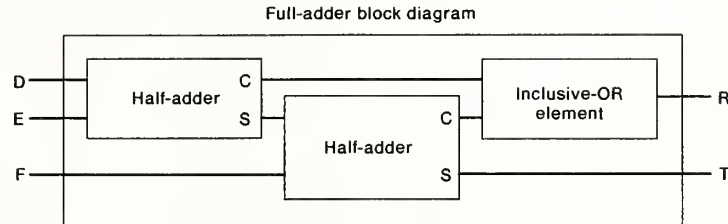


Figure 8 – Full adder

Input I minuend	0	0	1	1	0	0	1	1
Input J subtrahend	0	1	0	1	0	1	0	1
Input K borrow digit	0	0	0	0	1	1	1	1
Output W difference without carry	0	1	1	0	1	0	0	1
Output X borrow digit	0	1	0	0	1	1	0	1

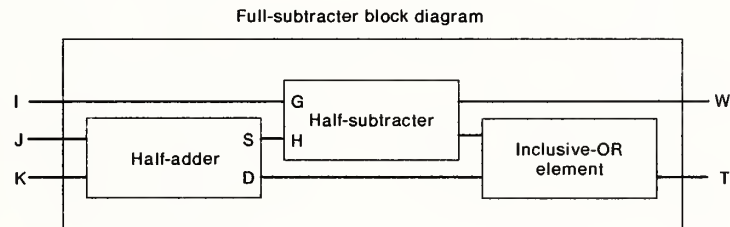


Figure 9 – Full subtracter

**fullword.** (ISO) Synonym for *computer word*.

**fully-connected network.** (1) (ISO) A *network* in which there is a *branch* between every pair of *nodes*. (2) See Figure 10.

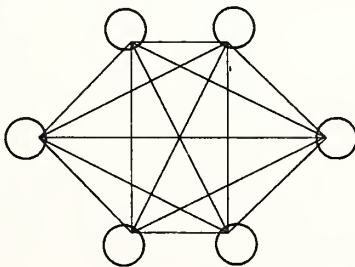


Figure 10 – Fully-connected network

**function.** (1) (ISO) A mathematical *entity* whose value, namely, the value of the dependent *variable*, depends in a specified manner on the values of one or more independent variables, with not more than one value of the dependent variable corresponding to each permissible combination of values from the respective ranges of the independent variables. (2) A specific purpose of an *entity*, or its characteristic action. (3) In *data communication*, a machine action such as *carriage return* or *line feed*. (4) See *automatic constant function*, *automatic function*, *Boolean function*, *clear-all function*, *clear-entry function*, *clear-memory function*, *constant function*, *control function*, *direct percentage function*, *equals function*, *extended result output function*, *factorial function*, *generating function*, *manual function*, *nonadd function*, *nonprint function*, *percentage function*, *recursive function*, *retrieval function*, *sign change*



*function, square function, square root function, subtotal function, threshold function, total function.*

**functional analysis.** (ISO) A systematic investigation of the *functions* of a real or planned system.

**functional design.** (1) (ISO) The specification of the *functions* of the components of a *system* and of the working relationships among them. (2) (ISO) The design of the *functional units* of a *system*, regardless of their physical representations.

**functional diagram.** A diagram that represents the working relationships among the parts of a *system*.

**functionality.** The capability to perform a *function*.

**functional programming language.** Synonym for *applicative programming language*.

**functional unit.** (ISO) An entity of *hardware, software*, or both, capable of accomplishing a specified purpose.

**function generator.** (ISO) A *functional unit* whose *output analog variable* is equal to some *function* of its *input variables*.

**function key.** A key that initiates a predefined or user-programmed operation; for example, an enter key, a programmed *function key*.

**function preselection capability.** (ISO) In a *calculator*, the ability to perform more than one *function* by a particular control element or key.

**function (procedure).** A *procedure* that, when executed, yields a value, and that has a name which may serve as a *procedure call* when used as an *operand* in an *expression*.

**function part.** (ISO) Synonym for *operation part*.

**function table.** (1) Two or more sets of *data* so arranged that an entry in one set selects one or more entries in the remaining sets; for example, a *dictionary*, a tabulation of the values of a *function* for a set of values of the *variable*. (2) A *functional unit* that can either *decode* multiple *inputs* into a single *output* or *encode* a single input into multiple outputs.

**functor.** In a *conceptual schema language*, a *linguistic object* that refers to a *function* on other linguistic objects such as *terms* and *sentences* and yields corresponding terms and sentences as *output values*.

## G

**gang punch.** (ISO) To *punch identical hole patterns* into each *punch card* of a *card deck*.

**gap.** See *head gap, interblock gap, interrecord gap*.

**gap character.** (ISO) A *character* that is included in a *computer word* for technical reasons but does not represent *data*.

**gap width.** (ISO) The dimension of the air gap in a *read/write head*, measured along the radius of the disk.

**garbage collection.** The process of identifying unused areas of *main storage*.

**gas panel.** (ISO) Synonym for *plasma panel*.

**gate.** (1) (ISO) A *combinational circuit* that performs an elementary *logic operation*, and generally involves one *output*. Synonymous with *logic element*. (2) See *AND gate, exclusive-OR gate, identity gate, IF-AND-ONLY-IF gate, IF-THEN gate, inclusive-OR gate, NAND gate, NOR gate, NOT gate, NOT-IF-THEN gate, threshold gate*.

**gateway.** See *LAN gateway*.

**general-purpose computer.** A *computer* that is designed to operate upon a wide variety of problems.

**general-purpose register.** A *register*, usually explicitly addressable, within a set of registers, that can be used for different purposes such as an *accumulator*, as an *index register*, or as a special handler of *data*.

**generate.** To produce a *computer program* by a selection of *subsets* from *skeletal code* under the control of *parameters*.

**generating function.** A *function* represented by an infinite series having as coefficients the successive terms, possibly with standardized multipliers, of a given *sequence of constants* or *functions*.

**generation.** (1) (ISO) In *micrographics*, a measure of the remoteness of the copy from the original material, the first *microfilm* representation being the first gener-

ation *microfilm*. (2) A means of referencing *items* with respect to time and ancestry such that an item without antecedents is designated as the first generation, and subsequent derivations are designated as the *n*th generation, where *n-1* is the number of derivations from the original.

**generator.** See *character generator, curve generator, dot matrix generator, function generator, fixed function generator, variable function generator, stroke character generator, vector generator*.

**global.** Pertaining to that which is defined in one subdivision of a *computer program* and used in at least one other subdivision of that computer program.

**glossary.** See *data glossary*.

**graphic.** (ISO) A *symbol* produced by a process such as handwriting, drawing, or printing. Synonymous with *graphic symbol*.

**graphic character.** (ISO) A *character*, other than a *control character*, that is normally produced by writing, printing, or displaying.

**graphic primitive.** (ISO) Synonym for *display element*.

**graphic symbol.** (ISO) Synonym for *graphic*.

**gray code.** A *binary code* in which *sequential numbers* are represented by binary expressions, each of which differs from the preceding expression in one place only. Synonymous with *reflected binary code*.

**grid.** In *optical character recognition*, two mutually orthogonal sets of parallel lines used for specifying or measuring *character images*.

**grouping factor.** (ISO) Synonym for *blocking factor*.

**group mark.** (ISO) A mark that identifies the beginning or the end of a set of *data* which may include *blocks, words, or other items*.

**group separator character (GS).** (ISO) The *information separator* intended to identify a logical boundary between items called groups.

**GS.** The *group separator character*.

**guide edge.** (ISO) Synonym for *reference edge*.





# H

**hacker.** (1) A computer enthusiast. (2) A computer enthusiast who uses his or her knowledge and means to gain unauthorized access to protected resources.

**half adder.** (ISO) A *combinational circuit* that has two *inputs* A and B and two *outputs*, one being a sum without *carry*, S, and the other being a *carry*, C, and in which the outputs are related to the inputs according to the table below.

Input A	0	0	1	1
Input B	0	1	0	1
Output S sum without carry	0	1	1	0
Output C carry	0	0	0	1

**half-duplex.** In *data communication*, pertaining to an alternating, one way at a time, independent *transmission*.

**half-duplex transmission.** (ISO) *Data transmission* in either direction, one direction at a time.

**half subtracter.** (ISO) A *combinational circuit* that has two *inputs* that are a minuend, G, and a subtrahend, H; and two *outputs* that are a difference without *carry*, U, and a *borrow digit*, V, and in which the *outputs* are related to the inputs according to the table below.

Input G minuend	0	0	1	1
Input H subtrahend	0	1	0	1
Output U difference	0	1	1	0
Output V borrow digit	0	1	0	0

**halfword.** A contiguous *sequence of bits or characters* that comprises half a *computer word* and that is capable of being addressed as a unit.

**halt.** See *breakpoint halt*.

**halt instruction.** (ISO) Synonym for *pause instruction*.

**hamming code.** A *data code* that can be corrected *automatically*.

**hamming distance.** Synonym for *signal distance*.

**hand-feed punch.** A *keypunch* into which cards are manually entered and removed one at a time.

**hand-held calculator.** (ISO) Synonym for *pocket calculator*.

**hard copy.** (ISO) In *computer graphics*, a permanent copy of a *display image* that is portable and can be read directly by human beings; for example, a display image that is recorded on paper.

**hard disk.** (ISO) A rigid *magnetic disk*.

**hard hyphen.** (ISO) A hyphen required by the spelling of a word or an expression regardless of its position in

a *line*. Synonymous with embedded hyphen, required hyphen. Contrast with *soft hyphen*.

**hard sectoring.** (1) (ISO) The physical marking of *sector boundaries* on a *magnetic disk*. (2) Contrast with *soft sectoring*.

**hardware.** (1) (ISO) Physical equipment, as opposed to *programs*, *procedures*, *rules*, and associated *documentation*. (2) Contrast with *software*.

**hardware check.** Synonym for *automatic check*.

**hash total.** The result obtained by applying an *algorithm* to a set of *data* for checking purposes; for example, a summation obtained by treating data items as *numbers*.

**HDA.** *Head/disk assembly*.

**head.** (1) A device that *reads*, *writes*, or *erases data* on a *storage medium*; for example, a small electromagnet used to read, write, or erase data on a *magnetic drum* or *magnetic tape*, or the set of perforating, reading, or marking devices used for punching, reading, or printing on *perforated tape*. (2) See *erase head*, *floating head*, *magnetic head*, *pre-read head*, *read head*, *read/write head*, *write head*.

**head crash.** (ISO) An accidental contact of a *magnetic head* with the surface of a rotating *data medium*.

**head/disk assembly (HDA).** (ISO) In a *magnetic disk unit*, an assembly that includes *magnetic disks*, *magnetic heads*, and an *access mechanism* all enclosed in a container.

**header card.** A card that contains *information* related to the *data* in cards that follow.

**header label.** (ISO) Synonym for *beginning-of-file label*.

**head gap.** (ISO) The distance between a *read/write head* and the surface of the *recording medium*.

**heading.** In *ASCII* and *data communication*, a *sequence of characters* preceded by the *start-of-heading character* that is used as machine sensible *address* or *routing information*.

**head loading zone.** (ISO) The relative distance that a *read/write head* travels with respect to a rotating *data medium*, in order to achieve the proper clearance between the head and the surface of the medium.

**head of form.** (ISO) Synonym for *first-line find*.

**head switching.** Changing from one *read/write head* to another to *read* from or *write* on another *magnetic data medium* or on another part of the same medium.

**Helsinki principle.** In a *conceptual schema language*, any meaningful exchange of utterances that depends upon the prior existence of an agreed-upon set of *semantic* and *syntactic* rules.

**heterogeneous computer network.** (ISO) A network of significantly dissimilar computers.

**heuristic method.** A method of solving problems that consists of a sequence of trials yielding approximate results, with control of the progression toward an acceptable final result; for example, the method of successive approximations.

**hexadecimal.** (1) (ISO) Characterized by a selection, choice or condition that has sixteen possible different values or states. Synonymous with sexadecimal. (2) (ISO) In a fixed-radix numeration system, a radix of sixteen.

**hidden line.** (ISO) In computer graphics, a line segment that represents an edge obscured from view in a two-dimensional projection of a three-dimensional object.

**hierarchical computer network.** (ISO) A computer network in which the control functions are distributed between two or more levels.

**hierarchical model.** (1) A data model whose pattern of organization has the form of a tree structure. (2) A data model that provides a tree structure for relating data elements, where each node of the tree corresponds to a group of data elements or a record type, and may have only one superior node.

**high-level language.** A programming language that does not reflect the structure of any particular computer or that of any particular class of computers. High-level languages are primarily designed for, and are syntactically oriented to, particular classes of problems.

**highlighting.** (ISO) Emphasizing a display element or segment by modifying its visual attributes.

**high-speed carry.** (ISO) In parallel addition, any procedure for speeding up the processing of carries; for example, a standing-on-nines carry.

**high-speed scrolling.** (ISO) Synonym for browse.

**hit.** (1) A comparison of two items of data that satisfies specified conditions. (2) A transient disturbance to a transmission medium.

**hold mode.** (ISO) The operating mode of an analog computer during which integration is stopped and all variables are held at the values they had when this mode was entered.

**hole pattern.** (ISO) A punching configuration or an array of holes that represent a single character.

**Hollerith.** Pertaining to a particular type of code or punched card that utilizes 12 rows per column and usually 80 columns per card.

**Hollerith card.** A punch card characterized by 80 columns and 12 rows of punch positions.

**home address.** (ISO) The information written on every track of a magnetic disk that identifies the track number on the face of the disk.

**homogeneous computer network.** (ISO) A network of similar computers.

**homonym.** In a conceptual schema language, one of two or more identical terms that refer to different entities.

**horizontal feed.** Pertaining to the entry of a punch card into a card feed with a long edge first.

**horizontal tabulation character (HT).** (ISO) A format effector character that causes the print or display position to move forward to the next of a series of predetermined positions along the same line.

**host computer.** (ISO) In a computer network, a computer that provides end users with services such as computation and database access and that usually performs network control functions.

**host-language.** In a database management system, pertaining to a programming language, such as COBOL, PL/I, or assembly language, in which the data manipulation capabilities of the database management system are embedded.

**host language system.** A database management system that is built upon the facilities of a programming language and depends on the application programmer for logical and physical file manipulations.

**host node.** (ISO) A node at which a host computer is located.

**hot zone.** (ISO) Synonym for margin-adjust zone.

**HT.** The horizontal tabulation character.

**hub.** (ISO) Synonym for tape spool.

**hybrid computer.** A computer that processes both analog and digital data.

**hyphenation control.** (ISO) A function that enables manual or automatic determination of whether to insert or omit a hyphen.

**hyphen drop.** (ISO) The function that ensures that a soft hyphen does not appear in the presentation of a word when it is not necessary to divide the word.

**hysteresis loop.** See magnetic hysteresis loop.



**IC memory.** *Integrated circuit memory.*

**icon.** A *symbol*, displayed on a screen, that enables a user to select an action, the object of the action, or both.

**identifier.** (1) (ISO) One or more *characters* used to identify or name a *data element* and possibly to indicate certain properties of that data element. (2) In *programming languages*, a *token* that names a *data object* such as a *variable*, an *array*, a *record*, a *subprogram*, or a *function*. (3) See *version identifier*.

**identity element.** (ISO) Synonym for *identity gate*.

**identity gate.** (ISO) A *gate* that performs an *identity operation*. Synonymous with *identity element*.

**identity operation.** (ISO) The *Boolean operation* whose result has the Boolean value 1 if and only if all the *operands* have the same Boolean value. An identity operation on two operands is an *equivalence operation*.

**identity unit.** An *n-input* unit that yields a specified *output signal* only when all *n-input* signals are alike.

**idle character.** See *synchronous idle character*.

**idle time.** (ISO) That part of *operable time* during which a *functional unit* is not operated.

**IF-AND-ONLY-IF element.** (ISO) Synonym for *IF-AND-ONLY-IF gate*.

**IF-AND-ONLY-IF gate.** (ISO) A *combinational circuit* that performs the *Boolean operation* of *equivalence*. Synonymous with *IF-AND-ONLY-IF element*.

**IF-AND-ONLY-IF operation.** (ISO) Synonym for *equivalence operation*.

**IF-THEN element.** (ISO) Synonym for *IF-THEN gate*.

**IF-THEN gate.** (ISO) A *combinational circuit* that performs the *Boolean operation* of *implication*. Synonymous with *IF-THEN element*.

**IF-THEN operation.** (ISO) Synonym for *implication*.

**ignore character.** (ISO) Synonym for *cancel character*.

**illegal character.** A *character* or combination of *bits* that is not valid according to some criteria; for example, with respect to a specified *alphabet*, a character that is not a member would be illegal in that set.

**image.** See *background image*, *card image*, *cine-oriented image*, *coded image*, *comic-strip-oriented image*, *display image*, *storage image*.

**image area.** In *micrographics*, that part of the film frame reserved for an image.

**image dissector.** In *optical character recognition*, a mechanical or electronic *transducer* that sequentially

detects the level of light intensity in different areas of a completely illuminated space.

**image processing.** The use of *computers* to analyze, enhance, or interpret digitized images. Synonymous with *picture processing*.

**image regeneration.** (ISO) In *computer graphics*, the sequence of events needed to generate a *display image* from its representation in *storage*.

**immediate access storage.** A *storage device* whose *access time* is negligible in comparison with other operating times.

**immediate address.** The contents of the *address part*; it contains the value of an *operand* rather than an *address*. Synonymous with *zero-level address*.

**immediate instruction.** An *instruction* that contains the value of an *operand* rather than its *address*.

**immediate operand.** The value of an *operand* contained within an *instruction* rather than the *address* of the operand.

**impact printer.** (ISO) A *printer* in which printing is the result of mechanical impacts.

**imperative language.** Synonym for *procedure-oriented language*.

**implication.** The *dyadic Boolean operation* whose result yields the value 0 if and only if the first *operand* has the Boolean value 1 and the second has the Boolean value 0. Synonymous with *conditional implication operation*, *IF-THEN operation*.

**implicit declaration.** In *computer programming languages*, a *declaration* whose specification is determined by a *default condition*.

**implied addressing.** (ISO) A method of addressing in which the *operation part* of an *instruction* implicitly addresses *operands*.

**imprinter.** Any device used to produce or impress marks or patterns on a surface, such as a printing press, a typewriter, a pen, a *cash register*, a book-keeping machine, or a pressure device such as that used with *credit cards* and *address plates*.

**imprinting.** (1) The act of using an *imprinter*. (2) The output of any *imprinter*.

**impulse.** (ISO) Synonym for *pulse*.

**incidental time.** (ISO) Synonym for *miscellaneous time*.

**inclusive-OR element.** (ISO) Synonym for *inclusive-OR gate*.

**inclusive-OR gate.** (ISO) A *combinational circuit* that performs the *Boolean operation* of *disjunction*. Synonymous with *inclusive-OR element*.



**inclusive-OR operation.** (ISO) Synonym for *disjunction*.

**inconnector.** In *flowcharting*, a *connector* that indicates a continuation of a broken *flowline*.

**incremental compiler.** A *compiler* that completes as much of the *translation* as is possible upon the *input* or scanning of each complete source statement; this compiler is typically used for *online computer program* development and checkout.

**incremental computer.** A *special-purpose computer* that is specifically designed to process changes in the *variables* as well as the absolute values of the variables.

**incremental coordinate.** (ISO) A *relative coordinate* whose previously addressed point is the reference point.

**incremental integrator.** A *digital integrator* modified so that the *output signal* is maximum negative, zero, or maximum positive when the value of the *input* is negative, zero, or positive.

**incremental representation.** (1) (ISO) A method of representing *variables* in which changes in the values of the variables are represented, rather than the values themselves. (2) See *ternary incremental representation*.

**incremental tape unit.** A *magnetic tape unit* that can record one *character* at a time, and create *record gaps* only when explicitly directed.

**incremental vector.** (ISO) A *vector* whose end point is specified as a displacement from its start point.

**increment size.** (ISO) The distance between adjacent *addressable points* on the *display surface*.

**independent compilation.** (ISO) The *compilation* of a *compilation unit* using all the necessary *interface* and *context information* from related compilation units.

**index.** (1) (ISO) A reference of *integer value*, or an *expression* that yields an integer value, that identifies the position of a *data item* with respect to some other data item. (2) A table or list of the contents of a *storage medium*, *file*, *document*, or *database*, together with *keys* or *references* for locating the contents. (3) A *symbol* or a *numeral* used to identify a particular quantity in an *array* of similar quantities. (4) In *micrographics*, a guide for locating *information* on a roll of *microfilm* using targets, flash cards, lines, bars, or other optical codes. (5) To prepare a list as in (2). (6) To move a machine part to a predetermined position, or by a predetermined amount, on a quantized scale. (7) See *code line index*.

**indexed access.** Pertaining to the organization and accessing of the records of a *storage structure* through a separate *index* to the *locations* of the stored records.

**indexed address.** An *address* that is modified by the content of an *index register* before or during the execution of a *computer instruction*.

**indexed sequential access.** Pertaining to the organization and accessing of records through an *index* of the *keys* that are stored in arbitrarily partitioned *sequential files*.

**index hole.** (ISO) A hole punched in a *diskette* to indicate the beginning of the first sector.

**index register.** (ISO) A *register* whose contents can be used to modify an *operand address* during the execution of *computer instructions*; it can also be used as a *counter*. An index register may be used to control the execution of a *loop*, to control the use of an *array*, as a *switch*, for *table lookup*, or as a *pointer*.

**index track.** (ISO) A *track* that contains *information* required to locate *data* on other tracks of the same *data medium*.

**index word.** (ISO) An *index modifier* applied to the *address part* of a *computer instruction*.

**indicator.** (ISO) A device that gives a visual or other indication of the existence or condition of a defined state.

**indirect address.** (ISO) An *address* of a *storage location* that contains an address.

**induction.** See *mathematical induction*.

**infinite loop.** (ISO) Synonym for *closed loop*.

**infinite pad method.** In *optical character recognition*, a method of measuring reflectance of a paper stock such that doubling the number of backing sheets of the same stock will not change the measured reflectance.

**infix notation.** (1) (ISO) A method of forming mathematical expressions, governed by rules of *operator precedence* and using paired *delimiters* such as parentheses, in which the operators are dispersed among the *operands*; each operator indicates the *operation* to be performed on the operands or the intermediate results adjacent to it. If it is desired to distinguish the case in which there are more than two operands for an operation, the term "distributed infix notation" may be used. For example, "A added to B and the sum multiplied by C" is represented by the expression  $(A + B) \times C$ ; P AND the result of Q AND R is represented by the expression  $P \& (Q \& R)$ . (2) Contrast with *postfix notation*, *prefix notation*.

**information.** (1) (ISO) The meaning that is currently assigned to *data* by means of the conventions applied to that data. (2) In a *conceptual schema language*, any kind of knowledge about things, facts, or concepts of a *universe of discourse* that is exchangeable among users. (3) See *formatted information*, *narrative information*.

**information analysis.** (ISO) A systematic investigation of the *information* and its flow in a real or planned system.

**information base.** In a *conceptual schema language*, a collection of *sentences*, consistent with each other and with the conceptual schema, that express *propositions* other than the *necessary propositions* that hold for a specific *entity world*.

**information bit.** In *telecommunication*, any *bit* generated by the *data source* and not used for error control by the *data transmission system*.

**information feedback system.** A *data transmission system* that uses an *echo check* to verify the *accuracy* of the *transmission*.

**information interchange.** The process of sending and receiving *data* in such a manner that the *information* content or meaning assigned to the *data* is not altered during the *transmission*.

**information processing.** *Data processing*, integrated with *processes* such as *office automation* and *data communication*.

**information processing system.** A system that performs *data processing* integrated with *processes* such as *office automation* and *data communication*. See also *data processing system*.

**information processor.** In a *conceptual schema language*, the mechanism that, in response to a *command*, executes an action on the conceptual schema, or on the *information base*.

**information resource.** All *Information* created manually or by *automated* means that an enterprise treats as a *resource* for decision making and problem solving.

**information resource dictionary (IRD).** (1) A collection of the *entities*, *relationships*, and *attributes* that are used by an organization to model its *information* environment. (2) Loosely, synonymous with *data dictionary/directory*.

**information resource dictionary schema.** The model of the logical structure of the *information resource dictionary* that consists of descriptors such as *entity types*, *relationship types*, and *attribute types*.

**information resource dictionary schema extensibility.** The capability to create new *functionality* in an *information resource dictionary system*.

**information resource dictionary system (IRDS).** (1) A *computer software system* that provides facilities for recording, storing, and processing descriptions of an organization's significant *information* and *information processing resources*. (2) A *computer software system* that maintains and manages an *information resource*

*dictionary*. (3) In a *conceptual schema language*, an *information system* that deals with the *information* about a *universe of discourse* and that consists of another *information system*, its environment, and its implementation in yet another, not necessarily disjoint, *information system*. (4) Loosely, synonymous with *data dictionary/directory system*.

**information resource dictionary system extensibility.** The capability to create new *functionality* in an *information resource dictionary system*.

**information resource management.** The policy, action, and procedures concerning *information*, both automated and nonautomated, that management establishes to serve the overall current and future needs of an enterprise. See also *data resource management*.

**information retrieval (IR).** (ISO) Actions, methods, and procedures for recovering *stored data* to provide *information* on a given subject.

**information separator (IS).** (ISO) Any *control character* used to delimit like units of *data* in a hierarchic arrangement of *data*. The name of the separator does not necessarily indicate the units of *data* that it separates. Synonymous with *separating character*.

**information system.** (1) A system that consists of people, machines, and methods for organizations to accomplish specified *operations* on *data* that represent *information*. An *information system* may include *data processing* equipment, such as *computers* and *storage devices*; *office machines*, such as *text processors* and *copiers*; *communications* equipment, such as *communication controllers* and *switching devices*; *peripheral equipment*; and associated *data media* and *accessories*. (2) In a *conceptual schema language*, the *conceptual schema*, *information base*, and *information processor*, that together define a formal, fully predictable system for keeping and manipulating *information*.

**information theory.** (ISO) The branch of learning concerned with the study of measures of *information* and associated properties.

**inherited error.** An *error* carried forward from a previous step in a *sequential process*.

**inhibiting signal.** (ISO) A *signal* that prevents the occurrence of an event.

**initial condition mode.** (ISO) That operating mode of an *analog computer* during which the *integrators* are inoperative and the initial conditions are set. Synonymous with *reset mode*.

**initialization.** (1) (ISO) The *operations* required before the use of a *data medium*, the implementation of a *process*, or the starting of a machine. (2) See *loop initialization*.



**initialize.** To set *counters*, *switches*, *addresses*, or contents of *storage* to zero or another starting value at the beginning of, or at prescribed points in, the operation of a *computer routine*.

**initial program loader (IPL).** A *bootstrap loader* that is used in a *computer* to load that part of an *operating system* needed to load the remainder of the *operating system*.

**inked ribbon.** A continuous ribbon, coated with ink, used on *output devices*.

**inking.** (ISO) In *computer graphics*, the creation of a line by moving a *locator* over the *display surface* leaving a trail behind the *locator* in the manner of a pen drawing a line on paper.

**ink jet printer.** (ISO) A *nonimpact printer* in which the *characters* are formed by projecting a jet of ink onto paper.

**inoperable time.** (ISO) That part of *down time* with all environmental conditions satisfied, during which a *functional unit* would not yield correct results if it were operated.

**input.** (1) (ISO) Pertaining to a device, *process*, or *channel* involved in the reception of *data* by a *computer* or by any of its components. (2) An input state, or a *sequence* of states. (3) See *manual input*.

**input area.** An area of *storage* reserved for *input*. Synonymous with *input block*.

**input block.** Synonym for *input area*.

**input channel.** A *channel* for impressing a state on a device or gate.

**input data.** (1) *Data* being received or to be received by a device or a *computer program*. (2) *Data* to be processed.

**input device.** (ISO) Synonym for *input unit*.

**input/output.** Pertaining to *input*, *output*, or both.

**input/output channel.** (ISO) A device that handles the transfer of *data* between *internal storage* and peripheral equipment.

**input/output controller (IOC).** (ISO) A *functional unit* that controls one or more *input/output channels*. Synonymous with *I/O controller*.

**input/output device.** (ISO) Synonym for *input/output unit*.

**input/output unit.** (ISO) A device into which *data* may be entered or that may convey *data* to another device. Synonymous with *input/output device*.

**input primitive.** (ISO) In *computer graphics*, an element of *data* obtained from an *input unit* such as a *keyboard*, a *choice device*, a *locator*, a *pick device*, or a *valuator*.

**input process.** (1) (ISO) The *process* that consists of the reception of *data* by any component of a *computer*. (2) The *process* of transmitting *data* from *peripheral equipment* or *auxiliary storage* to *internal storage*.

**input program.** A *utility program* that organizes an *input process* of a *computer*.

**input protection.** (ISO) For *analog input channels*, protection against overvoltages that may be applied between any two input connectors or between any input connector and ground.

**input state.** The state that prevails on a specified *input channel*.

**input station.** See *data input station*.

**input stream.** (ISO) Synonym for *job stream*.

**input subsystem.** (ISO) The part of a *process interface system* that transfers *data* from the *technical process* to the *process computer system*. Contrast with *output subsystem*.

**input unit.** (ISO) A device into which *data* may be entered for use by a *data processing system*. Synonymous with *input device*.

**insert.** (1) To introduce *data* between previously stored items of *data*. (2) In *text processing*, to introduce new *characters* or *text* within previously recorded text. The text is *automatically* rearranged to accommodate the addition.

**insertion.** (1) The introduction of *data* or *text* within previously stored *data* or *text*. (2) In a *conceptual schema language*, the addition of a *sentence* to the *information base* or to the *conceptual schema*.

**inquiry station.** (ISO) An *input/output unit* by which a user communicates with a *computer*.

**installation.** Synonym for *computer center*.

**installation time.** Time spent in installing and testing *hardware* or *software*.

**instance (of an entity type) occurrence.** In a *conceptual schema language*, an individual *entity*, for which a particular type of *proposition* holds, that is, an *entity* that belongs to a particular *class of entities*.

**instruction.** (1) (ISO) In a *programming language*, an expression that specifies one operation and identifies its operands, if any. (2) See *dummy instruction*, *effective instruction*, *extract instruction*, *jump instruction*, *machine instruction*, *macroinstruction*, *multiaddress instruction*, *multiple address instruction*, *no-operation instruction*, *privileged instruction*, *relative instruction*, *zero-address instruction*.

**instruction address.** (1) The address of an *instruction word*. (2) The address that must be used to fetch an *instruction*.



**instruction address register.** (ISO) A special purpose register used to hold the address of the next instruction to be executed. Synonymous with program register, instruction pointer register, P register.

**instruction code.** See *computer instruction code*.

**instruction control unit.** (ISO) In a processor, the part that retrieves instructions in proper sequence, interprets each instruction, and applies the proper signals to the arithmetic and logic unit and other parts in accordance with this interpretation. In an operating system, an instruction control unit may be designated as the main control unit by hardware, software, or both.

**instruction counter.** A counter that indicates the location of the next computer instruction to be interpreted.

**instruction format.** The ordered arrangement of the constituent parts of an instruction.

**instruction modifier.** (ISO) A word or part of a word that is used to alter an instruction.

**instruction pointer register.** (ISO) Synonym for *instruction address register*.

**instruction register.** (ISO) A register that is used to hold an instruction for interpretation.

**instruction repertoire.** (1) A complete set of the operators of the statements of a computer programming language, together with a description of the types and meanings that can be attributed to their operands. (2) Loosely, an instruction set.

**instruction set.** (1) (ISO) The set of the instructions of a computer, of a programming language, or of the programming languages in a programming system. (2) See *computer instruction set*.

**integer.** One of the numbers zero, +1, -1, +2, -2... Synonymous with integral number.

**integer programming.** (ISO) In operations research, a class of procedures for locating the maximum or minimum of a function subject to constraints where some or all variables must have integer values. Synonymous with discrete programming.

**integral number.** Synonym for *integer*.

**integrated circuit (IC) memory.** (ISO) A memory composed of transistors, diodes, and other circuit elements that are all fabricated on a chip of crystalline material.

**integrating motor.** A motor designed to give a constant ratio of output shaft rotational speed to input signal. Thus the angle of rotation of the shaft with respect to a datum is proportional to the time integral of the applied signal.

**integrator.** (1) (ISO) A functional unit whose output analog variable is the integral of an input analog vari-

able with respect to time, or a variable other than time.

(2) See *incremental integrator*.

**integrity.** See *data integrity, system integrity*.

**intelligence.** See *artificial intelligence*.

**intelligent terminal.** A functional unit, serving as a user terminal, capable of a certain degree of autonomous processing. Synonymous with programmable terminal.

**interactive.** Pertaining to a mode of operation of a computer in which the computer responds to each user entry and in which the user has the perception of directly influencing operations during the process. See also *conversational*.

**interblock gap.** Synonym for *block gap*.

**interchange.** See *information interchange*.

**interchange code.** See *binary-coded decimal interchange code*. See also *ASCII*.

**interface.** (1) (ISO) A shared boundary between two functional units, defined by functional characteristics, common physical interconnection characteristics, signal characteristics, and other characteristics, as appropriate. The concept involves the specification of the connection of two devices having different functions. (2) A point of communication between two or more processes, persons, or other physical entities. (3) See *panel interface, user interface*.

**interleave.** (ISO) To arrange parts of one sequence of things or events so that they alternate with parts of one or more other sequences of the same nature and so that each sequence retains its identity.

**intermediate equipment.** (ISO) Auxiliary equipment that may be inserted between the data terminal equipment and the signal conversion equipment to perform certain additional functions before modulation or after demodulation.

**intermediate node.** (ISO) A node that is common to more than one branch.

**internal event.** In a conceptual schema language, an event that occurs because of the termination of some permissible action in the information system. Contrast with *external event*.

**internal level.** In a conceptual schema language, all aspects that deal with the user-transparent representation of information within a computer implementation of an information system. Contrast with *external level*.

**internal memory.** (ISO) Synonym for *internal storage*.

**internal schema.** (1) The schema that describes data as it is physically stored and that includes all aspects of the environment in which a database is to reside. (2) In a conceptual schema language, the definition of the internal representation forms and their manipu-

lation aspects within a *computer* for the possible collections of *sentences* that are in the *conceptual schema* and in the *information base*. (3) Contrast with *external schema*.

**internal sort.** (1) A *sort* performed within *internal storage*. (2) A *sort program* or a *sort phase* that sorts two or more items within *main storage*.

**internal storage.** (ISO) *Storage* that is accessible by a *processor* without the use of *input/output channels*. It includes *main storage*, and may include other kinds of storage such as *cache memory* and *special registers* that can be accessed by the *processor*. Synonymous with *internal memory*.

**interoperability.** The capability of two or more systems to exchange and use *information*.

**interpret.** (ISO) To *translate* and to *execute* each *source language statement* of a *computer program* before translating and executing the next statement.

**interpreter.** (1) (ISO) A *computer program* used to *interpret*. Synonymous with *interpretive program*. (2) (ISO) A device that *prints* on a *punched card* the *characters* corresponding to *hole patterns* punched in the card. (3) See *transfer interpreter*.

**interpretive code.** The *instruction repertoire* of the *source language input* to an *interpreter*.

**interpretive program.** (ISO) Synonym for *interpreter* (1).

**interrecord gap.** The space between two consecutive records on a *data medium*.

**interrogation.** (ISO) The *process* whereby a *master station* requests a *slave station* to indicate its identity or its status.

**interoperability.** The capability of a *functional unit* to operate normally in different *data processing* environments in a way that requires users to have little or no knowledge of the unique characteristics of those units.

**interrupt.** (ISO) A suspension of a *process*, such as the *execution* of a *computer program*, caused by an event external to that process, and performed in such a way that the process can be resumed. Synonymous with *interruption*.

**interruption.** (ISO) Synonym for *interrupt*.

**interrupt register.** (ISO) A special-purpose *register* that holds *data* necessary for handling *interrupts*.

**intersection.** (ISO) Synonym for *conjunction*.

**interstage punching.** A mode of card punching such that the odd- or even-numbered *card columns* are used.

**interval timer.** (ISO) A device that, upon the lapse of a specified length of time, generates an *interrupt signal*.

**invert.** To change a physical or logical state to its opposite.

**inverted access.** Pertaining to the organization and access method of a *storage structure* that maintains a separate *index* whose entries are ordered by the *search keys* of the stored records.

**inverted file.** (1) A *file* whose sequence has been reversed. (2) In *information retrieval*, a cross-index *file* in which a *keyword* identifies a *record*; the items, numbers, or *documents* pertinent to that keyword are indicated.

**inverter.** (ISO) A *functional unit* whose *output analog variable* is equal in magnitude to its *input analog variable* but is of opposite algebraic sign.

**I/O.** *Input/output*.

**I/O controller.** (ISO) Synonym for *input/output controller*.

**IPL.** *Initial program loader*.

**IR.** *Information retrieval*.

**IRD.** *Information resource dictionary*.

**IRDS.** *Information resource dictionary system*.

**IRM.** *Information resource management*.

**IS.** *An information separator character*.

**ISO.** The *International Organization for Standardization*.

**isochronous transmission.** (ISO) A *data transmission process* in which there is always an integral number of unit intervals between any two significant instants.

**isolated amplifier.** (ISO) An amplifier without an electrical connection between the *signal circuit* and all other circuits, including ground.

**item.** (1) (ISO) An element of a *set of data*; as, for example, a *file* may consist of a number of items such as *records* which, in turn, may consist of other items. (2) Synonym for *data item*.

**item type.** A classification of a *data item* according to the representation of the values of the data item.

**iterative operation.** (ISO) The repetition of the *algorithm* for the solution of a *set of equations* with successive combinations of initial conditions or other *parameters*; each successive combination is selected by a subsidiary computation based on a predetermined *set of iteration rules*. Iterative operation is usually used to permit solution of boundary value problems or for *automatic optimization of system parameters*. Synonymous with *automatic sequential operation*.

## J

**jabber.** (ISO) In *local area networks*, transmission by a *data station* beyond the time interval allowed by the protocol.

**jabber control.** (ISO) In *local area networks*, the ability of a *medium attachment unit* to automatically interrupt transmission in order to inhibit an abnormally long *output data stream*.

**jam signal.** (ISO) A *signal* that carries a *bit* pattern sent by a *data station* to inform the other stations that they must not transmit. In *CSMA/CD networks*, the jam signal indicates that a *collision* has occurred; in *CSMA/CA networks*, the signal indicates that the sending station intends to transmit.

**JCL.** *Job control language.*

**job.** (ISO) A unit of work that is defined by a *user* and that is to be accomplished by a *computer*. Loosely, this term is sometimes used to refer to a representation of a *job*; the representation may include a set of *computer programs*, *files*, and *control statements* to the *operating system*.

**job control language (JCL).** A *problem-oriented language* that is designed to express *statements* in a *job* that are used to identify the *job* or to describe its requirements to an *operating system*.

**job control statement.** A *statement* in a *job* that is used to identify the *job* or to describe its requirements to the *operating system*.

**job-recovery control file.** (ISO) Synonym for *backup file*.

**job run.** (ISO) The performance of one or more *runs*.

**job step.** The execution of a *computer program* explicitly identified by a *job control statement*. A *job* may specify that several *job steps* be executed.

**job stream.** (ISO) The sequence of representations of *jobs* or parts of *jobs* to be performed, as submitted to an *operating system*. Synonymous with *input stream*, *run stream*.

**joggle.** To align a *card deck*, usually before placing the deck into a *card hopper*.

**journal.** (1) (ISO) A chronological record of *data processing operations* that may be used to reconstruct a previous or an updated version of a *file*. Synonymous with *log*. (2) In *database management systems*, the record of all *stored data items* whose values are changed as a result of *processing* and manipulation of the data.

**journaling.** The process of creating, recording, and maintaining a *journal*.

**joy stick.** (ISO) In *computer graphics*, a lever with at least two degrees of freedom that is used as an *input unit*, normally as a *locator*.

**jump.** (1) A *control transfer* that usually does not require a decision. (2) See *conditional jump*.

**justification.** The alignment of *text* to a vertical line, usually the left or right margin.

**justify.** (1) (ISO) To align *text* horizontally or vertically so that the first and last *characters* of every *line* or the first and last line of the text are aligned with their corresponding *margins*. The last line of a paragraph is often not justified. (2) (ISO) To *shift* the contents of a *register* or a *field* so that the significant *character* at the specified end of the *data* is at a particular position.





# K

**K.** When referring to *storage capacity* two to the tenth power, or 1024 in *decimal notation*.

**Karnaugh map.** (ISO) A rectangular diagram of a *logic function of variables* drawn with overlapping subrectangles, such that each intersection of overlapping rectangles represents a unique combination of the logic variables and such that an intersection is shown for all combinations.

**key.** (1) (ISO) An *identifier* within a set of *data elements*. (2) (ISO) One or more *characters*, within a set of *data*, that contains *information* about the set, including its identification. (3) In a *record*, a *data element* whose value is unique for each occurrence of the record and is used to identify or locate the record in a *database management system*. (4) On a *keyboard*, a manually actuated mechanism that performs a specific *operation* or causes the printing of a particular *character*. (5) See *access key*, *actual key*, *command key*, *database key*, *foreign key*, *function key*, *privacy key*, *search key*, *sort key*, *typing key*.

**keyboard.** (1) A configuration of *keys* used to enter *data*. (2) (ISO) In *text processing*, an arrangement of *typing keys*, *command keys*, and *function keys*.

**keyboard punch.** (ISO) Synonym for *keypunch*.

**key matching.** (ISO) The technique of comparing the *keys* of two or more *records* to select *items* for a particular stage of processing or to reject invalid records.

**keypunch.** (ISO) A *keyboard-actuated punch* that punches holes in a *data medium*. Synonymous with *keyboard punch*.

**keystroke.** The action of striking a *key*.

**keystroke counter.** In *text processing*, a device that counts the number of *key actuations*.

**key transformation.** A *function* that *maps* a set of *keys* into a set of *integers*, which can be used to determine the location of the *data elements* that correspond to the keys.

**keystroke verification.** (ISO) The *verification* of the *accuracy* of a *data entry* by the reentry of the same *data* through a *keyboard*.

**keyword.** (1) In a *programming language*, a *token* (2) that is usually specified by the language, and that uniquely characterizes a *statement*, or part of the statement; for example, in some languages IF designates an IF-statement. (2) One of the predefined *words* of an *artificial language*. (3) Synonym for *descriptor*, in the context of *information retrieval*.

**knowledge base.** In *artificial intelligence*, a *database* that contains *information* about human experience in a particular field of knowledge and *data* resulting from solution of problems that have been previously encountered. See also *expert system*.

**knowledge-based system.** Synonym for *expert system*.





## L

**label.** (1) (ISO) An *identifier* within or attached to a set of *data elements*. Synonymous with *tag*. (2) In *programming languages*, an *identifier* that names a *statement*.

**laced card.** A card *punched* accidentally or intentionally with holes in excess of the *hole patterns* required by the *character set* that is used.

**lag.** The delay between two events.

**LAN.** *Local area network*.

**LAN gateway.** (1) (ISO) A *functional unit* that connects a *local area network* with another *network* using different *protocols*. The network to which a local area network is connected may be another local area network, a public data network (PDN), or another type of network. (2) See also *bridge*.

**language.** (1) A set of *characters*, *conventions*, and *rules* that is used for conveying *information*. (2) See *algebraic language*, *algorithmic language*, *application-oriented language*, *artificial language*, *assembly language*, *command language*, *computer-oriented language*, *conceptual schema language*, *control language*, *high-level language*, *data definition language*, *data manipulation language*, *data storage definition language*, *data storage description language*, *device media control language*, *end-user language*, *host language*, *job control language*, *linear language*, *machine language*, *multidimensional language*, *natural language*, *object language*, *one-dimensional language*, *problem-oriented language*, *procedure-oriented language*, *programming language*, *query language*, *relational language*, *source language*, *stratified language*, *symbolic language*, *syntax language*, *target language*, *unstratified language*.

**language construct.** In a *programming language*, a syntactically allowable *program* or *subroutine* that may be constructed in accordance with the set of rules that comprise the grammar of the *language*.

**language processor.** (ISO) A *program* that performs such *functions* as *translating*, *interpreting*, and other tasks required for *processing* a specified *programming language*; for example, a FORTRAN processor, a COBOL processor.

**laser beam printer.** (ISO) Synonym for *laser printer*.

**laser printer.** (ISO) A *nonimpact printer* that creates, by means of a laser beam directed on a photosensitive surface, a latent image which is then made visible by a toner and transferred and fixed on paper. Synonymous with *laser beam printer*.

**last-in-first-out (LIFO).** A queuing technique in which the next *item* to be *retrieved* is the item most recently placed in the queue.

**latency.** (1) (ISO) The time interval between the instant at which an *instruction control unit* initiates a *call* for *data* and the instant at which the actual *transfer* of the data starts. Synonymous with *waiting time*. (2) See Figure 1.

**layout.** See *file layout*, *record layout*.

**layout character.** (ISO) Synonym for *format effector*.

**LCD.** *Liquid crystal display*.

**leader.** (1) The blank section of *tape* at the beginning of a *reel* of tape. (2) See *magnetic tape leader*.

**leading decision.** A *loop control* that is *executed* before the *loop body*.

**leading end.** The end of a *perforated tape* that first enters a *perforated-tape reader*.

**leading zero.** In *positional notation*, a zero in a more significant *digit place* than the *digit place* of the most significant nonzero *digit* of a *numeral*.

**leapfrog test.** A *check routine* that copies itself throughout *storage*.

**left-adjust.** To control the *display* or *printing position* of *characters* on a *page* so that the left-hand margin of the printing or display is regular. Synonymous with *left align*. Contrast with *right-adjust*.

**left-align.** Synonym for *left-adjust*.

**left-justify.** (1) To *shift* the contents of a *register* or *field* so that the significant *character* at the left-hand end of the *data* is at a particular position. (2) In *text processing*, deprecated term for *left-adjust*.

**length.** See *block length*, *record length*, *register length*, *word length*.

**letter.** (ISO) A *graphic character* that, when used alone or combined with others, primarily represents one or more concepts of a written *language* or one or more sound elements of a spoken language. Diacritical marks used alone and punctuation marks are not considered to be letters.

**letter-quality printer.** A *printer* that produces *text* that cannot be distinguished from text produced by an *electric typewriter*.

**level.** (1) The degree of subordination of an item in a hierarchical arrangement. (2) See *conceptual level*, *external level*, *internal level*, *logical level*, *physical level*.

**level number.** A reference *number* that indicates the position of an *item* in an hierarchical arrangement. Synonymous with *rank*.

**lexical object.** In a *conceptual schema language*, a simple *linguistic object* that expresses an elemental unit of meaning.

**LF.** The *line feed character*.

**library.** (1) A *file* or a *set* of related files; for example, a *set* of inventory control files in stock control. (2) A repository for demountable recorded media, such as *magnetic disk packs* and *magnetic tapes*. (3) See *program library*.

**library program.** (ISO) A *program* in a *program library*.

**library routine.** A *proven routine* that is maintained in a *program library*.

**life cycle.** See *system life cycle*.

**life cycle phase.** A portion of the *system life cycle* of an *information resource dictionary* that is used as a basis for a logical partition of the *information resource dictionary entities*.

**LIFO.** *Last-in-first-out*.

**light button.** (ISO) Synonym for *virtual push button*.

**light-emitting diode display.** (ISO) A *display device* that creates *characters* by means of a *dot matrix* of light-emitting diodes.

**light pen.** (ISO) A light-sensitive *pick device* that is used by pointing it at a *display surface*.

**light-pen detection.** (ISO) The sensing by a *light pen* of light generated by a *display element* on a *display surface*. Synonymous with *light-pen hit*.

**light-pen hit.** (ISO) Synonym for *light-pen detection*.

**light stability.** In *optical character recognition*, the resistance to change of the color of the image when exposed to radiant energy.

**limit check.** A *check* to determine whether a value lies above, below, or at a stipulated limit.

**limiter.** (ISO) A *functional unit* used to prevent an *analog variable* from exceeding specified limits.

**line.** (1) (ISO) In *data transmission*, the portion of a *data circuit* external to *data circuit-terminating equipment* (DCE) that connects the DCE to a *data switching exchange*, that connects a DCE to one or more other DCE's, or that connects a *data switching exchange* to another *data switching exchange*. Synonymous with *transmission line*. (2) A linear arrangement of *graphic characters*. (3) See *acoustic delay line*, *character spacing reference line*, *delay line*, *display line*, *electromagnetic delay line*, *flowline*, *hidden line*, *magnetic delay line*, *offline*, *online*, *printing line*, *typing line*, *writing line*, *X-datum line*, *Y-datum line*. (4) See Figure 6.

**linear language.** A *language* that is customarily expressed as a *linear representation*; for example, *FORTRAN* is a linear language; a *flowchart* is not.

**linear list.** (ISO) A linearly ordered *set* of *data elements* that have the same structure in *storage* and whose order is preserved in *storage* by using *sequential allocation*.

**linear optimization.** (ISO) Synonym for *linear programming*.

**linear programming (LP).** In *operations research*, a procedure for locating the maximum or minimum of a *linear function* of *variables* that are subject to *linear constraints*. Synonymous with *linear optimization*.

**linear representation.** An arrangement of *graphics* in a one-dimensional space.

**linear search.** (ISO) A *search* in which a *set* of *data* is scanned in a *sequential search*.

**line/battery-powered calculator.** (ISO) A *calculator* that draws its power from a *battery* or from the main electrical power supply.

**line counter.** (ISO) In *text processing*, a device that counts the number of lines processed.

**line feed.** (ISO) The movement of the *printing position* or *display position* to the corresponding position on the next line.

**line feed character (LF).** (ISO) A *format effector* that causes the print or *display position* to move to the corresponding position on the next line.

**line graphics.** Synonym for *coordinate graphics*.

**line-powered calculator.** (ISO) A *calculator* that depends solely for its power upon connection to the main electrical power supply.

**line printer.** (ISO) A *printer* that prints a line of *characters* as a unit.

**linguistic object.** In a *conceptual schema language*, a syntactically allowable construct in a *language*. See also *lexical object*.

**link.** (1) (ISO) To interconnect *data items* or portions of one or more *programs*; for example, to link *object programs* by a *linkage editor*, or to link *data items* by *pointers*. (2) In *computer programming*, to provide a link. (3) In *computer programming*, the part of a *program*, in some cases a single *instruction* or an *address*, that passes control and parameters between separate portions of the program. Synonymous with *linkage*. (4) A connection that represents a *relationship* that is made between *entities* in order to provide some additional *information* that may not be inherent in the *attributes* associated with those entities. (5) See *data link*.

**linkage.** Synonym for *link* (3).



**linkage editor.** A program for creating a *load module* from one or more *object modules* or load modules, or by resolving cross references among the object modules, and possibly by relocating elements. Synonymous with *linker*.

**linked list.** (ISO) Synonym for *chained list*.

**linked list search.** (ISO) Synonym for *chained list search*.

**linker.** Synonym for *linkage editor*.

**liquid crystal display (LCD).** A display device that creates characters by means of the action of reflected light on patterns formed by a liquid that becomes opaque when it is energized.

**LISP.** (list processor) An *applicative programming language* oriented to list processing, recursion, and character string manipulation and logic; it is widely used for artificial intelligence applications and is based on the lambda calculus of mathematical logic.

**list.** (1) (ISO) An ordered set of data items. (2) To print or otherwise display data items that meet specified criteria. (3) See *chained list*, *linear list*, *linked list*, *pushdown list*, *pushup list*, *symmetrical list*.

**list processing.** (ISO) A method of processing data in the form of lists. Usually, *chained lists* are used so that the logical order of items can be changed without altering their physical locations.

**literal.** (1) In programming languages, a token that directly represents a value; for example, 14 represents the integer fourteen; APRIL represents the fourth month of the year; 3.0005E2 represents the number 300.05. In BASIC and in FORTRAN, the term *constant* is used for this concept. (2) (ISO) In a source program, an explicit representation of the value of a data item that must remain unaltered during any translation of the source program; for example, the word FAIL in the instruction if x = 0 print FAIL.

**load.** (1) (ISO) To enter data or programs into storage or working registers. (2) To insert data values into a database that previously contained no occurrences of data.

**load-and-go.** An operating technique in which there are no stops between the loading and execution phases of a computer program, and which may include assembling or compiling.

**loaded origin.** The address of the initial storage location of a computer program in main storage at the time the computer program is loaded.

**loader.** (1) A routine, commonly a computer program, that reads data into main storage. (2) See *absolute loader*, *bootstrap loader*, *initial program loader*, *relocating loader*.

**load mode.** In some variable-word-length computers, data transfer such that certain delimiters are moved with the data.

**load module.** (ISO) A module that is the output of a linkage editor and that is in a form suitable for loading into main storage for execution.

**load point.** (ISO) The position on a magnetic tape that is indicated by the beginning-of-tape marker.

**lobe.** (ISO) A pair of channels between a data station and a lobe attaching unit, one channel for sending and one for receiving, as seen from the point of view of the attached data station.

**lobe attaching unit.** (ISO) A functional unit used to connect data stations to and disconnect data stations from a ring network without disrupting network operations.

**lobe bypass.** (ISO) The capability of a lobe attaching unit to disconnect a lobe and its attached data station from a ring network for replacement, relocation, or repair without disrupting network operations.

**local.** (1) In programming languages, pertaining to the relationship between a language construct and a block, such that the language construct has a scope that is contained within the block. (2) Pertaining to that which is defined and used only in one subdivision of a computer program.

**local area network (LAN).** A data network, located on a user's premises, within a limited geographic region. Communication within a local area network is not subject to external regulation; however, communication across the network boundary may be subject to some form of regulation. A local area network does not use store-and-forward techniques.

**local area network broadcast.** (ISO) The transmission of a transmission frame that is intended to be accepted by all other data stations on the same local area network.

**local area network multicast.** (ISO) The transmission of a transmission frame that is intended to be accepted by a group of selected data stations on the same local area network.

**location.** (1) Any place in which data may be stored. (2) See *protected location*, *storage location*.

**locator.** (ISO) An input unit that provides coordinates of a position; for example, a mouse, a tablet.

**lock.** (1) To prevent the operation of an input device; for example, to prevent actuation of the keys of a keyboard. (2) A facility used to control access to a resource. See *exclusive lock*, *privacy lock*. (3) In an information resource dictionary system with entity-level security, a mechanism for restricting



*authorization* for a set of operations to a particular *entity* of the *information resource dictionary*.

**locking.** (1) (ISO) Pertaining to the characteristic of *code extension characters* that changes the interpretation that applies to all coded representations that follow or to all coded representations of a given class, until the next appropriate code extension character occurs. (2) Control or prevention of access to *resources* or entry of *data*.

**lock out.** (ISO) Synonym for *protection*.

**lock-out facility.** (ISO) The facility that inhibits the entry of *data* into a *calculator* when the calculator is in *overflow* or in *error condition*.

**log.** (ISO) Synonym for *journal*.

**logger.** (1) (ISO) A *functional unit* that records events and physical conditions, usually with respect to time. (2) A device that enables a *user entity* to log in; for example, to identify itself, its purpose and the time of entry; and to log out with the corresponding *data* so that the appropriate accounting procedures may be carried out in accordance with the *operating system*.

**logging.** (1) The recording of *data* about events that occur in time *sequence*. (2) The *automatic* recording of *data* concerning attempts by the *system* to *query* or update a *database*.

**logic.** See *double-rail logic*, *formal logic*, *mathematical logic*, *symbolic logic*.

**logical.** (1) Pertaining to content or meaning as opposed to location or actual implementation. (2) Pertaining to a view or description of *data* that does not depend on the characteristics of the *computer system* or of the physical *storage*. (3) Contrast with *physical*.

**logical add.** (ISO) Synonym for *disjunction*.

**logical comparison.** (ISO) The examination of two *strings* to determine if they are identical.

**logical data structure.** An *end-user* view of the *relationships* among *data elements*.

**logical level.** In a *conceptual schema language*, the level that is, or that describes, an aspect of an *information system* that is independent of, but related to, the realization of the information system. Contrast with *physical level*.

**logical link control protocol.** (ISO) In a *local area network*, the protocol that governs the assembling of *transmission frames* and their exchange between *data stations* independently of the *medium access control protocol*.

**logical multiply.** Synonym for *AND*.

**logical operation.** (ISO) Synonym for *logic operation* (1).

**logical record.** A *record* independent of its physical environment; portions of one logical record may be located in different physical records, or several logical records or parts of logical records may be located in one physical record.

**logical schema.** A *schema* that defines a *data model*.

**logical shift.** A *shift* that affects all *bits* or *characters* of a *computer word* equally. Synonymous with *logic shift*.

**logical structure.** Synonym for *data structure*.

**logic design.** (ISO) A *functional design* that uses formal methods of description, such as *symbolic logic*.

**logic device.** (ISO) A device that performs *logic operations*.

**logic diagram.** (ISO) A graphic representation of a *logic design*.

**logic element.** (1) (ISO) Synonym for *gate*. (2) See *combinational gate*, *sequential gate*.

**logic instruction.** An *instruction* in which the operation part specifies a *logic operation*.

**logic operation.** (1) (ISO) An *operation* that follows the rules of *symbolic logic*. Synonymous with *logical operation*. (2) (ISO) An *operation* in which each *character* of the result depends only on the corresponding character of each *operand*.

**logic shift.** (ISO) Synonym for *logical shift*.

**logic symbol.** (ISO) A *symbol* that represents an *operator*, a *function*, or a functional relationship.

**logic unit.** (1) A part of a *computer* that performs *logic operations*, and related operations. (2) See *arithmetic and logic unit*.

**log off.** To request the termination of a *session*.

**log on.** To request the initiation of a *session*.

**longitudinal magnetic recording.** (ISO) A technique of *magnetic recording* in which magnetic polarities representing *data* are aligned along the length of the recording *track*.

**longitudinal parity check.** (ISO) A *parity check* on a row of *bits* that are members of a *set* forming a *matrix*; for example, a parity check on the bits of a *track* on a *block* on *magnetic tape*.

**longitudinal redundancy check (LRC) character.** On a *magnetic tape* where each *character* is represented as a lateral row of *bits*, a character used for *checking the parity* of each *track* in the longitudinal direction. Such a character is usually the last character recorded in each *block* and is used in some *magnetic recording systems* to re-establish the initial recording status.

**loop.** (1) (ISO) A *sequence of instructions* that may be *executed* iteratively while a certain condition prevails.

In some implementations, no test is made to discover whether the condition prevails until the loop has been executed once. (2) See *closed loop*, *feedback loop*, *infinite loop*, *magnetic hysteresis loop*.

**loop check.** (ISO) Synonym for *echo check*.

**loop construct.** In *programming languages*, a *language construct* that specifies an iteration in the *execution sequence*, such as *DO loops* in *FORTRAN*; *FOR loops* in *ALGOL*; *PERFORM loops* in *COBOL*; and *DO WHILE loops* in *PL/I*.

**loop control.** The parts of a *loop* that modify the *loop-control variables* and determine whether to continue to execute the loop or to exit from the loop.

**loop-control variable.** A *variable* that is modified by the *loop control* during *execution* of a *loop* in order to accomplish the purpose of the loop.

**loop initialization.** The parts of a *loop* that set the starting values of the loop.

**lower curtate.** The adjacent *card rows* at the bottom of a *punch card*.

**low-level language.** Synonym for *computer-oriented language (1)*.

**LP.** *Linear programming*.

**LRC.** *Longitudinal redundancy check*.

**Lukasiewicz notation.** (ISO) Synonym for *prefix notation*.





# M

**MAC.** *Medium access control.*

**machine.** See *accounting machine, electrical accounting machines, Turing machine, universal Turing machine.*

**machine code.** (ISO) Synonym for *computer instruction code.*

**machine instruction.** (ISO) An *instruction* that can be executed by the processor of the computer for which it has been designed as part of the *machine language.*

**machine instruction set.** Synonym for *computer instruction set.*

**machine language.** An *artificial language* whose elements are *machine instructions.* Synonymous with *computer language.*

**machine learning.** The ability of a device to improve its performance based on its past performance.

**machine operation.** Synonym for *computer operation.*

**machine-oriented language.** Synonym for *computer-oriented language (2).*

**machine-readable medium.** A medium that can convey *data* to a given sensing device. Synonymous with *automated data medium.*

**machine-readable passport.** (ISO) A passport that is intended to be read and verified by a machine in accordance with an ISO standard.

**machine word.** (ISO) Synonym for *computer word.*

**macro.** (ISO) Synonym for *macroinstruction.*

**macrodeclaration.** (ISO) Synonym for *macrodefinition.*

**macrodefinition.** (ISO) A *declaration* that provides the *skeletal code* which a *macrogenerator* uses in replacing a *macroinstruction.* Synonymous with *macrodeclaration.*

**macro-generating program.** (ISO) Synonym for *macrogenerator.*

**macrogenerator.** (ISO) A *computer program* that replaces *macroinstructions* in the *source language* with the defined sequence of *instructions* in the *source language.* Synonymous with *macro-generating program.*

**macroinstruction.** (ISO) An *instruction* in a *source language* that is to be replaced by a defined sequence of *instructions* in the same *source language* and may also specify values for *parameters* in the replaced *instructions.* Synonymous with *macro, macro statement.*

**macroprogramming.** *Computer programming* with *macroinstructions.*

**macro statement.** (ISO) Synonym for *macroinstruction.*

**magnetic card.** (ISO) A card with a magnetizable layer on which *data* can be stored.

**magnetic card storage.** (ISO) A *magnetic storage* in which *data* are stored by *magnetic recording* on the surface of thin flexible cards.

**magnetic cell.** A *storage cell* in which different patterns of magnetization are used to represent *characters.* Synonymous with *static magnetic cell.*

**magnetic core.** (1) (ISO) A piece of magnetic material, usually toroidal in shape, used for *storage.* (2) A configuration of magnetic material that is, or is intended to be, placed in a spatial relationship to current-carrying conductors and whose magnetic properties are essential to its use. It may be used to concentrate an induced magnetic field as in a transformer induction coil, or armature, to retain a magnetic polarization for the purpose of *storing data,* or for its nonlinear properties as in a gate. It may be made of such material as iron, iron oxide, or ferrite and in such shapes as wires, tapes, toroids, rods, or thin film.

**magnetic core storage.** (ISO) A *storage device* that uses magnetic properties of certain materials.

**magnetic delay line.** A *delay line* whose operation is based on the time of propagation of magnetic waves.

**magnetic disk.** (ISO) A flat circular plate with a magnetizable surface layer, on one or both sides of which *data* can be stored.

**magnetic disk storage.** (ISO) A *magnetic storage* in which *data* are stored by *magnetic recording* on the flat surfaces of one or more disks that, in use, rotate around a common spindle.

**magnetic disk unit.** (ISO) A device that contains *magnetic disks, a disk drive, one or more magnetic heads, and associated controls.*

**magnetic drum.** (ISO) A right circular cylinder with a magnetizable layer on which *data* can be stored.

**magnetic drum storage.** (ISO) A *magnetic storage* in which *data* are stored by *magnetic recording* on the surface of a *magnetic drum* that rotates on its axis when in use.

**magnetic drum unit.** (ISO) A device that contains a *magnetic drum, the mechanism for moving it, magnetic heads, and associated controls.*

**magnetic head.** (ISO) An electromagnet that can perform one or more *functions* of *reading, writing, and erasing data* on a *magnetic data medium.*

**magnetic hysteresis loop.** A closed curve showing the relation between the magnetization force and the induction of magnetization in a magnetic substance

when the magnetized field is carried through a complete cycle.

**magnetic ink.** (ISO) A special ink that contains particles of magnetic material suitable for recording data.

**magnetic ink character.** (ISO) A *character* whose pattern of *magnetic ink* is sensed to enable *automatic interpretation*.

**magnetic ink character reader (MICR).** (ISO) An *input unit* that reads, by means of *magnetic ink character recognition*, characters printed with magnetic ink.

**magnetic ink character recognition (MICR).** (ISO) The *automatic recognition of characters* printed with ink that contains particles of magnetic material.

**magnetic recording.** (ISO) A technique of *storing data* by selectively magnetizing portions of a magnetizable material.

**magnetic storage.** (ISO) A *storage device* that utilizes the magnetic properties of certain materials.

**magnetic stripe.** (ISO) On an *identification card*, a strip of magnetic material that is suitable for recording data for subsequent *machine reading*.

**magnetic stripe reference card.** An *identification card* that is equipped with a certified magnetic reference tape for use in standardizing *encoders* and *readers*.

**magnetic tape.** (ISO) A tape with a magnetizable layer on which *data* can be *stored*.

**magnetic tape cartridge.** A container that holds a *magnetic tape* on *reels* driven at their periphery at constant speed that can be used without separating the tape from its container.

**magnetic tape cassette.** A container that holds a *magnetic tape* on *reels* whose axes are driven at a variable speed that can be used without separating the tape from its container.

**magnetic tape drive.** (ISO) A device for moving *magnetic tape* and controlling its movement. Synonymous with magnetic tape transport.

**magnetic tape leader.** (ISO) The portion of *magnetic tape* that precedes the *beginning-of-tape marker* and that is used to thread the tape.

**magnetic tape storage.** (ISO) A *magnetic storage* in which *data* are *stored* by magnetic recording on the surface of a tape that moves longitudinally in use.

**magnetic tape trailer.** (ISO) The portion of *magnetic tape* that follows the *end-of-tape marker*.

**magnetic tape transport.** (ISO) Synonym for *magnetic tape drive*.

**magnetic tape unit.** (ISO) A device containing a *tape drive*, *magnetic heads*, and associated controls.

**magnetic thin film.** A layer of magnetic material, usually less than one micron thick, often used for *storage cells*.

**magnetic thin film storage.** A *magnetic storage* in which *data* are *stored* by magnetic recording on a film of molecular thickness, coated on a substrate.

**magnetographic printer.** (ISO) A *nonimpact printer* that creates, by means of *magnetic heads* operating on a metallic drum, a latent image that is then made visible by a toner and transferred and fixed on paper.

**main control unit.** (ISO) In a *processor* with more than one *instruction control unit*, that instruction control unit to which, for a given interval of time, the other instruction control units are subordinated. In an *operating system*, an instruction control unit may be designated as the main control unit by *hardware*, by *software*, or by both.

**mainframe.** A large *computer*, usually one to which other computers are connected in order to share its *resources* and computing power.

**mains/battery-powered calculator.** See *line/battery-powered calculator*.

**malns-powered calculator.** See *line-powered calculator*.

**main storage.** (ISO) That part of *internal storage* into which *instructions* and other *data* must be *loaded* for subsequent *execution* or *processing*. In large systems, this term is preferred to the term *memory*. Synonymous with primary storage.

**maintainability.** (ISO) The ease with which maintenance of a *functional unit* can be performed in accordance with prescribed requirements.

**maintenance.** (1) (ISO) Any activity intended to restore or retain a *functional unit* in a state in which the unit can perform its required *functions*. Maintenance includes keeping a functional unit in a specified state by performing activities such as tests, measurements, replacements, adjustments, and repairs. (2) See *corrective maintenance*, *deferred maintenance*, *emergency maintenance*, *file maintenance*, *preventive maintenance*, *scheduled maintenance*.

**maintenance panel.** (ISO) A part of a unit of equipment that is used for interaction between the equipment and a *maintenance engineer*.

**maintenance time.** (1) Time used for *hardware maintenance*; it includes *preventive maintenance time* and *corrective maintenance time*. (2) See *corrective maintenance time*, *deferred maintenance time*, *emergency maintenance time*, *preventive maintenance time*.

**major industry identifier.** On a *credit card*, the first *digit* of the *primary account number*; it serves as an *identifier* of the industry group of the card issuer.



**majority.** A logic operator having the property that if P is a statement, Q is a statement, R is a statement, then the majority of P, Q, R is true if more than half the statements are true, false if half or less are true.

**majority element.** (ISO) Synonym for *majority gate*.

**majority gate.** (ISO) A combinational circuit that performs a *majority operation*. Synonymous with majority element.

**majority operation.** (ISO) A threshold operation in which each of the operands may take only the values 0 and 1; it takes the value 1 if and only if the number of operands having the value 1 is greater than the number of operands that have the value zero.

**makeup time.** That part of available time used for reruns due to faults or mistakes in operations.

**malfunction.** Synonym for *failure*.

**management.** See *data management, data resource management, data resources management, information resource management*.

**management information system (MIS).** The total flow of information within an enterprise that supports the decision-making functions of management at all organizational levels of the enterprise.

**Manchester encoding.** (1) (ISO) A digital encoding technique in which each bit period is divided into two complementary halves: a transition in the middle of the bit period represents the binary digit "1," while the opposite transition represents the binary digit "0." (2) See *differential Manchester encoding*.

**manipulation.** See *algebraic manipulation, formula manipulation, symbol manipulation*.

**mantissa.** (1) (ISO) The non-negative fractional part of the representation of a logarithm. (2) (ISO) In *floating-point representation*, synonym for *fixed-point part*.

**manual answering.** (ISO) Answering in which a call is established only if the called user signals readiness to receive the call by means of a manual operation.

**manual calling.** (ISO) In a data network, calling that permits the entry of selection signals from a calling data station into the line at an undefined character rate. The characters may be generated at the data terminal equipment or at the data circuit-terminating equipment.

**manual function.** (ISO) In a calculator, a function initiated or effected by an operator.

**manual input.** (1) The entry of data by hand into a device. (2) The data entered, as in (1).

**manual input register.** A register that can receive data from a manually operated source.

**map.** (1) (ISO) A set of values that have a defined correspondence with the values or quantities of another set. (2) (ISO) To establish a set of values, as in (1); for example, in the evaluation of a mathematical function, to establish the values of the dependent variable of the function, for those values of the independent variable or variables that are of immediate concern. (3) See *Karnaugh map*.

**margin.** An area, in which generally there is no printing or display, that lies between the text or display area of a page or screen and the edge of the page or screen. Margins may contain elements such as small illustrations, headers, footers, notes, and page numbers.

**margin-adjust zone.** (ISO) In text processing, an area generally five to seven characters, in which the right margin is set through hyphenation or carry-over to the next line. Synonymous with hot zone, line-end zone, line-ending zone.

**marginal check.** (ISO) Synonym for *marginal test*.

**marginal test.** (ISO) A technique in which certain operating conditions, such as voltage or frequency supplied, are varied about their nominal values in order to detect and locate components with incipient faults. Synonymous with marginal check.

**margin control.** (ISO) A machine function that sets the right or left indentation of one or more lines.

**margin indent.** (ISO) In text processing, the temporary displacement of one or more lines with respect to the original margin.

**margin-release control.** (ISO) In text processing, a control used to override the left-hand or right-hand margin stops to allow typing beyond these set limits.

**mark.** (ISO) A symbol or symbols that indicate the beginning or the end of a field, of a word, or of a data item in a file, record, or block. (2) See *document mark, group mark*.

**marker.** (1) (ISO) In computer graphics, a glyph with a specified appearance that is used to indicate a particular position on a display surface. (2) See *beginning-of-tape marker, decimal marker, end-of-tape marker*.

**Markov chain.** A probabilistic model of events in which the probability of an event is dependent only on the event that precedes it.

**mark scanning.** (ISO) The automatic optical sensing of marks recorded manually on a data medium. Synonymous with optical mark reading.

**mark-sensing.** The electrical sensing of conductive marks usually recorded manually on a nonconductive data medium.

**mark-sensing card.** A card on which mark-sensible fields have been printed.



**mark-sensing column.** A line of *mark-sensible* positions, parallel to the *Y-datum* line of a card.

**mark-sensing row.** A line of *mark-sensible* positions parallel to the *X-datum* line of a card.

**mask.** (ISO) A pattern of *characters* that is used to control the retention or elimination of portions of another pattern of characters.

**master clock.** (ISO) A device that generates periodic, accurately spaced *signals* that are used for such purposes as timing, regulation of the *operations* of a processor, or generation of *interrupts*.

**master station.** (ISO) In *basic mode link control*, the *data station* that has accepted an invitation to ensure a *data transfer* to one or more *slave stations*. At a given instant, there can be only one master station on a *data link*.

**match.** A comparison that is made to determine similarities or differences of the *items* compared.

**mathematical check.** A *programmed* check that is based on mathematical relationships. Synonymous with arithmetic check.

**mathematical induction.** (ISO) A method of proving a statement concerning terms based on *natural numbers* not less than *N* by showing that the statement is valid for the term based on *N* and that, if it is valid for an arbitrary value of *n* that is greater than *N*, it is also valid for the term based on  $(n + 1)$ .

**mathematical logic.** (ISO) Synonym for *symbolic logic*.

**mathematical model.** A mathematical representation of a process, device, or concept.

**mathematical programming.** (ISO) In *operations research*, a procedure for locating the maximum or minimum of a *function* subject to constraints.

**matrix.** (1) (ISO) A rectangular *array* of elements, arranged in *rows* and *columns*, that may be manipulated according to the rules of matrix algebra. (2) By extension, an *array* of any number of dimensions. (3) In *computers*, a logic network in the form of an *array* of *input* leads and *output* leads with *gates* connected at some of their intersections.

**matrix printer.** (ISO) Synonym for *dot matrix printer*.

**matrix storage.** Storage whose elements are arranged in such a manner that access to any *location* requires the use of two or more coordinates; for example, *cathode ray storage*.

**maximum allowable common mode overvoltage.** (ISO) The highest value of the *common mode voltage* that can be applied to an *input subsystem* without causing circuit damage, but with the possibility of a temporary loss of function. The *maximum common*

*mode voltage* is lower than the *maximum operating common mode voltage*, which is lower than the maximum allowable common mode overvoltage. The term may be shortened to maximum allowable overvoltage, if the context is clear.

**maximum allowable normal mode overvoltage.** (ISO) The highest value of the *normal mode voltage* that can be applied to an *input subsystem* without causing circuit damage, but with the possibility of a temporary loss of function. The *maximum normal mode voltage* is lower than the *maximum operating normal mode voltage*, which is lower than the maximum allowable normal mode overvoltage. The term may be shortened to maximum allowable overvoltage, if the context is clear.

**maximum common mode voltage.** (ISO) The highest value for the *common mode voltage* at which the subsystem will continue to operate according to its specifications. The maximum common mode voltage is lower than the *maximum operating common mode voltage*, which is lower than the *maximum allowable common mode overvoltage*.

**maximum normal mode voltage.** (ISO) The highest value for the *normal mode voltage* at which the subsystem will continue to operate according to its specifications. The maximum normal mode voltage is lower than the *maximum operating normal mode voltage*, which is lower than the *maximum allowable normal mode overvoltage*.

**maximum operating common mode voltage.** (ISO) The highest value for the *common mode voltage* that can be applied to an *input subsystem*, and at which the subsystem will continue to operate, but at reduced performance. The *maximum common mode voltage* is lower than the maximum operating common mode voltage, which is lower than the *maximum allowable common mode overvoltage*. The term may be shortened to maximum operating voltage, if the context is clear.

**maximum operating normal mode voltage.** (ISO) The highest value for the *normal mode voltage* that can be applied to an *input subsystem*, and at which the subsystem will continue to operate, but at reduced performance. The *maximum normal mode voltage* is lower than the maximum operating normal mode voltage, which is lower than the *maximum allowable normal mode overvoltage*. The term may be shortened to maximum operating voltage, if the context is clear.

**MDI.** *Medium dependent interface*.

**mean access time.** (ISO) An average *access time* that results from the normal operation of a device.

**mean rate accuracy.** (ISO) *Error margin*, excluding errors caused by *noise* at *input*, that should not be

exceeded when a device is used under normal operating conditions.

**mean time between failures (MTBF).** (ISO) For a stated period in the life of a *functional unit*, the mean value of the lengths of time between *consecutive failures* under stated conditions.

**mean time to repair (MTTR).** (ISO) For a stated period in the life of a *functional unit*, the average time required for *corrective maintenance*.

**medium.** See *blank medium*, *data medium*, *empty medium*, *machine-readable medium*, *transmission medium*, *virgin medium*.

**medium access control (MAC) protocol.** (ISO) In a *local area network*, the *protocol* that governs communication on the *transmission medium* without concern for the physical characteristics of the medium, but taking into account the topological aspects of the network, in order to enable the exchange of *data* between *data stations*.

**medium attachment unit.** (ISO) In a *local area network*, a device used in a *data station* to couple the *data terminal equipment* with the *transmission medium*.

**medium dependent interface.** (ISO) In a *local area network*, the material and electrical *interface* between the *transmission medium* and a *medium attachment unit*.

**memory.** (1) (ISO) All of the addressable *storage space* in a *processing unit* and other *internal memory* that is used to *execute instructions*. (2) *Main storage*, when used in reference to *calculators*, *microcomputers*, and some *minicomputers*. (3) See *cache memory*, *internal memory*, *main memory*, *programmable read-only memory*, *random-access memory*, *reprogrammable read-only memory*, *sigma memory*.

**memory address register.** A *register* in a *processing unit* that contains the *address* of the *storage location* being accessed.

**memory indicator.** (ISO) On a *calculator*, a visual indication that a *number* is being held in *memory*. Synonymous with *storage indicator*, *store indicator*.

**memory partitioning.** (ISO) In *calculators*, the subdividing of *storage* into independent sections. Synonymous with *storage partitioning*.

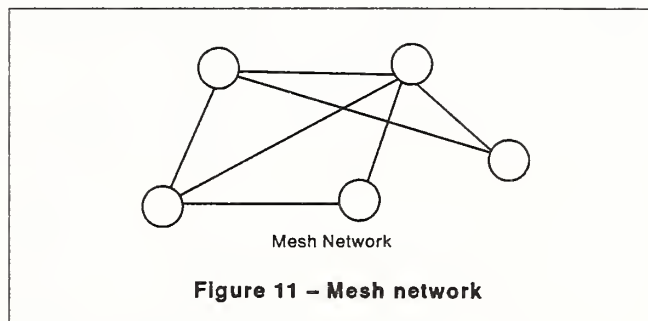
**menu.** A *displayed list* of options from which a *user* selects actions to be performed.

**mercury storage.** A *storage device* that utilizes the acoustic properties of mercury to store *data*.

**merge.** (1) (ISO) To combine the elements of two or more *sets* that are in a given *order* into a single set in the same order. (2) See *balanced merge*.

**merge sort.** (1) A *sort program* in which the elements in a *set* are divided into *subsets*, the *items* in each subset are sorted, and the resulting sorted subsets are merged. (2) See *balanced merge sort*, *unbalanced merge sort*.

**mesh network.** (1) (ISO) A *network* in which there are at least two *nodes* with two or more *paths* between them. (2) See Figure 11.



**message.** (1) An arbitrary amount of *information* whose beginning and end are defined or implied. (2) In a *conceptual schema language*, a collection of one or more *sentences* or *commands* that may be used as an *information exchange* between the *environment* and the *information system*.

**message sink.** (ISO) That part of a communication system in which *messages* are considered to be received.

**message source.** (ISO) That part of a communication system from which *messages* are considered to originate.

**message switching.** (ISO) In a *data network*, the process of routing *messages* by receiving, *storing*, and forwarding complete messages.

**metadata.** In *database management systems*, *information* about an organization's *information* and *data* activities.

**metalanguage.** A *language* that may be used to specify itself or other languages.

**metastable state.** (ISO) Synonym for *unstable state*.

**method.** See *heuristic method*.

**MICR.** (1) *Magnetic ink character recognition*. (2) *Magnetic ink character reader*.

**microcode.** A *sequence* of *microinstructions* that is fixed in *storage* that is not *program-addressable*, and that performs specific *processing functions*.

**microcomputer.** A *computer system* whose *processing unit* is a *microprocessor*. A basic microcomputer includes a *microprocessor*, *storage*, and an *input/output facility*, which may or may not be on one *chip*.



**microfiche.** A sheet of *microfilm* capable of containing *microimages* in a grid pattern, usually containing a title that can be read without magnification.

**microfilm.** (1) A high resolution film for recording *microimages*. (2) To record *microimages* on film.

**microfilmer.** See *computer output microfilmer*.

**microfilming.** See *computer output microfilming*.

**microform.** A medium such as *microfiche*, or *microfilm*, that is suitable for recording *microimages*.

**micrographics.** (1) That branch of science and technology concerned with methods and techniques for converting any form of *information* to or from *microform*. (2) See *computer micrographics*.

**microimage.** An image that is too small to be read without magnification.

**microinstruction.** (ISO) An *instruction* that controls *data flow* and *sequencing* in a *processor* at a more fundamental level than *machine instructions*. Individual machine instructions and perhaps other *functions* may be implemented by *microprograms*.

**microprocessor.** (1) (ISO) A *processor* whose elements have been miniaturized into one or a few integrated *circuits*. (2) An integrated *circuit* that accepts *coded instructions* at one or more terminals, *executes* the instructions received, and delivers *signals* that describe its status. The instructions may be entered, integrated, or stored internally.

**microprogram.** A sequence of *microinstructions* that are in special storage where they can be dynamically accessed to perform various *functions*.

**microprogramming.** (1) (ISO) The preparation or use of *microprograms*. (2) (ISO) The technique used in the design of *hardware* that is to be controlled by a *microprogram*.

**minimum delay programming.** A method of *programming* in which *storage locations* for *instructions* and *data* are chosen so that *access time* is reduced and minimized.

**minimum distance code.** A *binary code* in which the *signal distance* does not fall below a specified minimum value.

**mirroring.** (ISO) One hundred and eighty degrees of rotation of *display elements* about an axis in the plane of the *display surface*.

**MIS.** *Management information system*.

**miscellaneous time.** (ISO) That part of *operating time* that is not *rerun time*, *system production time*, or *system test time*, but time typically used for demonstrations, *operator training*, or other such purposes. Synonymous with *incidental time*.

**missing pulse.** (ISO) A *pulse* whose level cannot be read or recorded.

**mistake.** (ISO) A human action that produces an unintended result.

**mixed-base notation.** (ISO) Synonym for *mixed-base numeration system*.

**mixed-base numeration system.** (ISO) A *numeration system* in which a *number* is represented as the sum of a series of terms, each of which consists of a *mantissa* and a *base*, the base of a given term being constant for a given application but the bases being such that there are not necessarily integral ratios between the bases of all the terms; for example, with bases  $b_3$ ,  $b_2$ , and  $b_1$  and mantissas 6, 5, and 4, the number represented is given by  $6b_3 + 5b_2 + 4b_1$ . A mixed-radix numeration system is the particular case of a mixed-base numeration system in which, when the terms are ordered so that their bases are in descending magnitudes, there is an integral ratio between the bases of adjacent terms, but not the same ratio in each case; thus, if the smallest base is  $b$  and if  $x$  and  $y$  represent *integers*, the numeral 654 in such a numeration system represents the number given by  $6xyb + 5xb + 4b$ . A fixed-radix numeration system is the particular case of a mixed-base numeration system in which, when the terms are ordered so that their bases are in descending magnitudes, there is the same integral ratio between bases of all pairs of adjacent terms; thus if  $b$  is the smallest base and if  $x$  represents an integer, the numeral 654 in such a numeration system represents the number given by  $6x^2b + 5xb + 4b$ . Synonymous with *mixed-base notation*.

**mixed-radix notation.** (ISO) Synonym for *mixed-radix numeration system*.

**mixed-radix numeration system.** (ISO) A *radix numeration system* in which the *digit places* do not all necessarily have the same *radix*; for example, a numeration system in which three successive *digits* represent hours, tens of minutes, and minutes; taking one minute as the unit, the *weights* of the three digit places are 60, 10, and 1, respectively; the radices of the second and third digit places are 6 and 10, respectively. A comparable numeration system that used one or more digits to represent days and two digits to represent hours would not satisfy the definition of any radix numeration system, since there is no integral ratio of the weights of the digit places representing days and hours. Synonymous with *mixed-radix notation*.

**mnemonic symbol.** (ISO) A *symbol* chosen to assist the human memory; for example, an abbreviation such as *mpy* for multiply.



**mode.** See *access mode, add mode, compute mode, conversational mode, fixed decimal mode, floating decimal mode, hold mode, initial condition mode, interactive mode, load mode, operate mode, potentiometer set mode, reset mode, static test mode.*

**model.** See *CODASYL model, coexistence model, data model, hierarchical model, mathematical model, network model, relational model.*

**modem.** (ISO) A *functional unit* that modulates and demodulates *signals*. One of the *functions* of a modem is to enable *digital data* to be transmitted over *analog transmission facilities*. The term is a contraction of *modulator-demodulator*.

**modification.** (1) An addition or change to *stored data* or a *deletion* of *stored data*. (2) In a *conceptual schema language*, the replacement of a *sentence* in the *information base* or *conceptual schema* by another one, thus potentially changing the collection of sentences that are deducible.

**modification command.** In a *data manipulation language*, one of a set of *statements* that allows an *application program* or a *database administrator* to insert, update, and delete *information stored* in a *database*.

**modified frequency modulation recording.** (ISO) *Non-return-to-reference recording* in which there is a change in the condition of magnetization in the center of a cell containing a one, and a change in the boundary between two cells when both cells contain a zero.

**modularity.** The extent to which a *system* is composed of *modules*.

**modulation rate.** (ISO) The reciprocal of the measure of the shortest nominal time interval between successive significant instants of the modulated *signal*. When this measure is expressed in seconds, the modulation rate is expressed in *baud*.

**modulator.** (ISO) A *functional unit* that converts a *signal* into a modulated signal suitable for *transmission*.

**modulator-demodulator.** See *modem*.

**module.** (1) In *programming languages*, a self-contained subdivision of a *program* that may be separately *compiled*. (2) A *discrete set of instructions*, usually processed as a unit, by an *assembler*, a *compiler*, a *linkage editor*, or similar *routine* or *subroutine*. (3) In an *information resource dictionary system*, a set of capabilities that may be required or optional. (4) A packaged functional *hardware unit* suitable for use with other components. (5) See *data module, load module, object module, programming module*.

**modulo-n check.** (ISO) A *check* in which a value is divided by a *number*, *n*, to generate a remainder that

is compared with the remainder previously calculated. Synonymous with *residue check*.

**modulo-n counter.** (ISO) A *counter* in which the *number* represented reverts to zero in the *sequence* of counting after reaching a maximum value of *n-1*.

**monadic Boolean operator.** A *Boolean operator* that has only one *operand*; for example, NOT.

**monadic operation.** (ISO) An *operation* on one and only one *operand*. Synonymous with *unary operation*.

**monadic operator.** (ISO) An *operator* that represents an *operation* on one and only one *operand*. Synonymous with *unary operator*.

**monitor.** (1) (ISO) A device that observes and records selected activities within a *data processing system* for analysis. Possible uses of monitors are to indicate significant departures from the norm, or to determine levels of utilization of particular *functional units*. (2) *Software* or *hardware* that observes, supervises, controls, or verifies the *operations* of a *system*. (3) Synonym for *video display unit, visual display unit*.

**monitor program.** A *computer program* that observes, regulates, controls, or verifies the *operations* of a *data processing system*.

**monospacing.** A function that spaces *characters* horizontally in relationship to the same widths. Synonymous with *fixed pitch*. See also *proportional spacing*.

**monostable.** Pertaining to a device that has one *stable state*.

**monostable trigger circuit.** (ISO) A *trigger circuit* that has one *stable state* and one *unstable state*.

**Monte Carlo method.** A method of obtaining an approximate solution to a *numerical problem* by the use of *random numbers*; for example, the *random walk method*, or a procedure using a *random number sequence* to calculate an integral.

**mount.** (ISO) To place a *data medium* in a position to operate.

**mouse.** (ISO) In *computer graphics*, a hand-held *locator* that is operated by moving it on a flat surface. A mouse generally contains a *control ball* or a pair of wheels.

**move.** (ISO) Synonym for *transfer* (2).

**MTBF.** *Mean time between failures*.

**MTTR.** *Mean time to repair*.

**multiaddress.** (ISO) Pertaining to an *instruction format* containing more than one *address part*.

**multiaperture core.** A *magnetic core*, usually used for nondestructive *reading*, with two or more holes through which wires may be passed in order to create more than one magnetic path.

**multidimensional language.** A language whose expressions are assembled in more than one dimension, such as *flowcharts*, *logic diagrams*, *block diagrams*, and *decision tables*.

**multipass sort.** A sort program that is designed to sort more items than can be in main storage at one time.

**multiple precision.** (ISO) Characterized by the use of two or more computer words to represent a number in order to enhance precision.

**multiple punching.** Punching more than one hole in the same card column by several keystrokes, usually in order to extend the character set of the keypunch.

**multiplex.** To interleave or simultaneously transmit two or more messages on a single channel.

**multiplexer.** (1) (ISO) In process control, a device that combines several input signals into a single output signal in such a manner that each of the input signals can be recovered. (2) A device capable of interleaving the events of two or more activities or capable of distributing the events of an interleaved sequence to the respective activities. (3) See *data multiplexer*.

**multiplexing.** (ISO) In data transmission, a function that permits two or more data sources to share a common transmission medium such that each data source has its own channel.

**multiplex operation.** A mode of operation in which the events of two or more activities are interleaved and, when required, the events in the interleaved sequence are distributed to the respective activities.

**multipoint connection.** (ISO) A connection established among more than two data stations for data trans-

mission. The connection may include switching facilities.

**multipoint network.** (ISO) A network in which there are exactly two endpoint nodes, any number of intermediate nodes, and only one path between any two nodes.

**multiprocessing.** (1) (ISO) A mode of operation that provides for parallel processing by two or more processors of a multiprocessor. (2) The simultaneous execution of two or more computer programs or sequences of instructions by a computer. (3) Loosely, parallel processing.

**multiprocessor.** (ISO) A computer that has two or more processors that have common access to a main storage.

**multiprogramming.** (ISO) A mode of operation that provides for the interleaved execution of two or more computer programs by a single processor.

**multitasking.** (ISO) A mode of operation that provides for concurrent performance or interleaved execution of two or more tasks.

**multirange amplifier.** (ISO) An amplifier that has a switchable, programmable, or automatically set amplification factor in order to adapt different analog signal ranges to a specified output range.

**MUMPS (Massachusetts General Hospital Utility Multi-programming System).** A high-level interactive computer programming language for use in the development and implementation of interactive information systems with shared databases.

# N

**n-adic Boolean operation.** (ISO) A *Boolean operation* on *n* and only *n* operands.

**n-adic operation.** (ISO) An operation on *n* and only *n* operands.

**NAK.** The *negative acknowledge character*.

**name.** (1) An *identifier* of an *entity*. (2) In a *conceptual schema language*, a simple *linguistic object* that is used to identify an *entity*. (3) See *access name*, *assigned access name*, *assigned descriptive name*, *descriptive name*, *qualified name*, *variation name*.

**NAND.** A *logic operator* having the property that if *P* is a statement, *Q* is a statement, *R* is a statement, then the NAND of *P*, *Q*, *R*, is true if at least one statement is false, false if all statements are true. Synonymous with NOT AND, Sheffer stroke.

**NAND element.** (ISO) Synonym for *NAND gate*.

**NAND gate.** (ISO) A *combinational circuit* that performs the *Boolean operation of nonconjunction*. Synonymous with NAND element.

**NAND operation.** (ISO) Synonym for *nonconjunction*.

**narrative information.** Information that is presented according to the syntax of a *natural language*. Contrast with *formatted information*.

**n-ary.** (1) (ISO) Characterized by a selection, choice or condition that has *n* possible different values or states. (2) (ISO) Pertaining to a *fixed radix numeration system* that has a *radix* of *n*.

**natural language.** (ISO) A *language* whose rules are based on current usage without being explicitly prescribed.

**natural number.** (ISO) One of the *numbers zero, one, two,...* In some cases *natural numbers* are defined as starting at one rather than zero. Synonymous with nonnegative integer.

**n-bit byte.** (ISO) A *string* that consists of *n bits*.

**NC.** *Numerical control*.

**NDR.** (ISO) *Nondestructive read*.

**NDRO.** (ISO) *Nondestructive read*.

**necessary proposition.** In a *conceptual schema language*, a *proposition* asserted to hold for all *entity worlds* and to be a necessary part of all possible *proposition worlds*.

**needle.** In an *information retrieval operation*, a probe that may be passed through holes or notches to assist in sorting or selecting cards.

**negate.** (ISO) To perform the *negation operation*.

**negation.** (ISO) The monadic *Boolean operation* whose result has a Boolean value opposite to that of the *operand*. Synonymous with NOT operation.

**negative-acknowledge character (NAK).** A *transmission control character* sent by a station as a negative response to the station with which the *connection* has been set up.

**negative entry.** (ISO) The assignment of a negative sign to a *number* entered into a *calculator*.

**negative indication.** (ISO) On a *calculator*, a visual indication that the *number* shown has a negative value.

**NEITHER-NOR operation.** (ISO) Synonym for *nondisjunction*.

**nest.** (1) (ISO) To incorporate one or more structures of one kind into another structure of the same kind; the structure may be a *loop*, a *subroutine*, or a set of *statements*. (2) To place *subroutines* or *data* into other subroutines or data at a different hierarchical level so that the subroutines can be executed recursively and the data can be accessed recursively.

**network.** (ISO) An arrangement of *nodes* and interconnecting *branches*. (2) See *bus network*, *carrier sense multiple access with collision avoidance network*, *carrier sense multiple access with collision detection network*, *computer network*, *data network*, *fully-connected network*, *heterogeneous computer network*, *hierarchical computer network*, *homogeneous computer network*, *local area network*, *mesh network*, *ring network*, *slotted-ring network*, *star network*, *star-ring network*, *token-bus network*, *token-ring network*, *tree network*.

**network analog.** The expression and solution of mathematical relationships between *variables* that are represented by circuits.

**network analyzer.** A device that simulates a *network*, such as an electrical supply network.

**network architecture.** (ISO) The logical structure and the operating principles of a *computer network*. The operating principles of a network include those concerning services, *functions*, and *protocols*.

**network chart.** (ISO) A directed graph used to describe and schedule events, activities, and their relationships in *project control*.

**network model.** A *data model* that consists of a modified *tree structure* that permits all but the *root record* to have multiple owner records.

**network planning.** (ISO) A technique that uses *network charts* to plan, schedule, and control *projects*.

**new-line character (NL).** A *format effector* that causes the print or *display* position to move to the first position on the next line.



**nines complement.** (ISO) The *diminished radix complement* in the *decimal numeration system*. Synonymous with complement-on-nine.

**NL.** The *new line character*.

**node.** (1) (ISO) In a *network*, the point at the end of a *branch*. (2) The representation of a state or an event by means of a point on a diagram. (3) In a *tree structure*, a point at which subordinate *data items* originate. (4) See *adjacent node*, *data processing node*, *endpoint node*, *host node*, *intermediate node*, *terminal node*.

**noise.** (1) (ISO) A disturbance that affects a *signal* and that may distort the *information* carried by the signal. (2) Random variations of one or more characteristics of any *entity* such as voltage, current, or *data*. (3) A random *signal* of known statistical properties of amplitude, distribution, and spectral density. (4) Loosely, any disturbance tending to interfere with the normal operation of a device or system.

**nominal transfer rate.** (ISO) The maximum number of *binary characters* that may be transferred per unit of time.

**nonadd function.** (ISO) In a *printing calculator*, the *function* that allows the printing of *characters* without affecting calculations.

**nonconjunction.** (ISO) The *dyadic Boolean operation* whose result has the Boolean value 0 if and only if each *operand* has the Boolean value 1. Synonymous with NAND operation, NOT-BOTH operation.

**nondestructive read (NDR, NDRO).** (ISO) *Reading* that does not erase the *data* in the source location.

**nondisjunction.** (ISO) The *dyadic Boolean operation* whose result has the Boolean value 1 if and only if each *operand* has the Boolean value 0. Synonymous with NEITHER-NOR operation, NOR operation.

**nonembedded command.** (ISO) In *text processing*, a *program instruction* that causes an immediate change to the *document* being processed at the time the *command* is entered.

**nonequivalence operation.** (ISO) The *dyadic Boolean operation* whose result has the Boolean value 1 if and only if the *operands* have different Boolean values. Synonymous with exclusive-OR operation.

**nonescaping key.** A *key* that does not cause an advance to the next *imprint position* when the key is struck.

**nonidentity operation.** (ISO) The *Boolean operation* whose result has the Boolean value 1 if and only if all the *operands* do not have the same Boolean value. A nonidentity operation on two operands is a *nonequivalence operation*.

**nonimpact printer.** (ISO) A *printer* in which printing is not the result of mechanical contacts with the printing medium.

**nonisolated amplifier.** (ISO) An amplifier that has an electrical connection between the *signal* circuit and another circuit, including ground.

**nonlinear optimization.** (ISO) Synonym for *nonlinear programming*.

**nonlinear programming.** (ISO) In *operations research*, a procedure for locating the maximum or minimum of a *function of variables* that are subject to constraints, when either the function or the constraints, or both, are nonlinear. Synonymous with nonlinear optimization.

**nonlocking.** Pertaining to the characteristic of *code extension characters* in which a change in interpretation applies only to a specified number of the coded representations following; usually, that number is one.

**nonnegative integer.** (ISO) Synonym for *natural number*.

**nonpolarized return-to-zero recording (RZ(NP)).** *Return-to-reference recording* in which zeros are represented by the absence of magnetization, ones are represented by a specified condition of magnetization, and the reference condition is zero magnetization. The specified condition is usually saturation. Conversely, the absence of magnetization can be used to represent ones, and the magnetized condition to represent zeros. Synonymous with dipole modulation.

**nonprint function.** (ISO) In a *calculator*, the *function* that allows the disengagement of the printing mechanism.

**nonprinting calculating machine.** A *calculating machine* that can *display* one or more of the significant elements of a computation; the machine may be capable of direct *processing* of the elements as they are entered, or it may store the elements for later processing by the *arithmetic unit*.

**nonprogrammable.** Pertaining to a device whose *functions* cannot be changed by modifying *instructions* contained within it.

**nonprogrammable calculator.** (ISO) A *calculator* whose *program* cannot be changed by the operator.

**nonremovable disk.** A disk or *diskette* that is permanently installed in a device. Synonymous with fixed disk, hard disk.

**non-return-to-reference recording.** (ISO) The *magnetic recording of binary characters* such that patterns of magnetization used to represent zeros and ones occupy the whole storage cell, with no part of the cell magnetized to a reference condition.

**non-return-to-zero change-on-ones recording (NRZ-1).** (1) (ISO) *Non-return-to-reference recording*

in which the ones are represented by a change in the condition of a magnetization, and zeros are represented by the absence of change; the *signals* are explicitly recorded. (2) Synonymous with non-return-to-zero (mark) recording. (3) See Figure 12.

**nonvolatile storage.** (ISO) A *storage device* whose contents are not lost when power is cut off.

**NOR.** A *logic operator* having the property that if P is a statement, Q is a statement, R is a statement, then the NOR of P, Q, R is true if all statements are false,

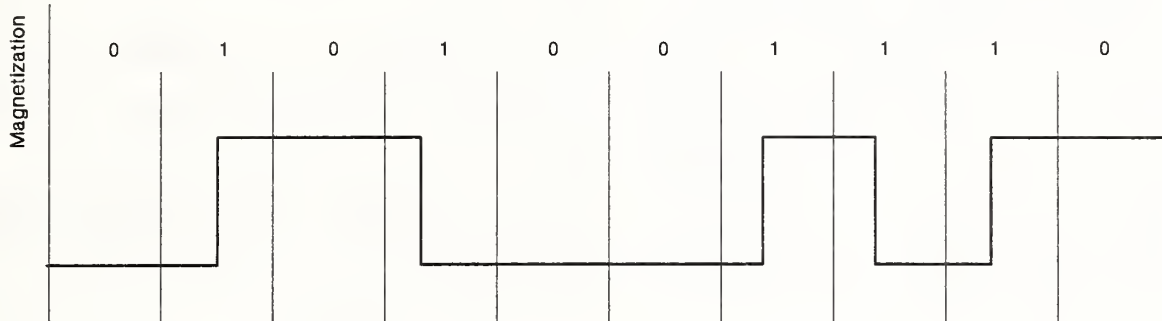


Figure 12 – Non-return-to-zero change-on-ones recording (NRZ-1)

**non-return-to-zero (change) recording (NRZ(C)).** (1) (ISO) *Non-return-to-reference recording* in which zeros are represented by magnetization to a specified condition, and ones are represented by magnetization to a specified alternative condition. The two conditions may be saturation and zero magnetization but are more commonly saturation in opposite senses; the recorded magnetic condition is changed when, and only when, the recorded *binary character* changes from zero to one or from one to zero. (2) See Figure 13.

false if at least one statement is true.  $P \text{ NOR } Q$  is often represented by a combination of OR and NOT symbols, such as  $\sim (P \vee Q)$ .  $P \text{ NOR } Q$  is also called neither P nor Q. Synonymous with NOT-OR.

**NOR element.** (ISO) Synonym for *NOR gate*.

**NOR gate.** (ISO) A *combinational circuit* that performs the *Boolean operation* of *nondisjunction*. Synonymous with NOR element.

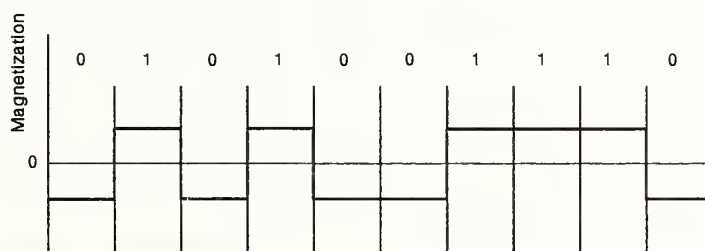


Figure 13 – Non return-to-zero (change) recording (NRZ (C))

**non-return-to-zero (inverted) recording (NRZ-I).** Depreciated term for *non-return-to-zero change-on-ones recording (NRZ-1)*.

**non-return-to-zero (mark) recording (NRZ(M)).** Synonym for *non-return-to-zero change-on-ones recording*.

**non-return-to-zero recording (NRZ).** *Non-return-to-reference recording* in which the reference condition is zero magnetization.

**normal direction flow.** (ISO) A flow direction from left to right or top to bottom on a *flowchart*.

**normalization.** The *process* of restructuring a *relation* for the purpose of reducing it to its simplest form, so that each of its *attributes* is based on a simple *domain* that consists of single, noncomposite values.

**normalize.** (1) (ISO) In a *floating-point representation system*, to make an adjustment to the *fixed-point part* and the corresponding adjustment to the *exponent* in a *floating-point representation* to ensure that the fixed-

point part lies within some prescribed range, the *real number* represented remaining unchanged. For example, in order to bring the fixed-point part into the range 1 to 9.99..., the floating-point part representation  $123.45 \times 10^2$  may be normalized to  $1.2345 \times 10^4$ . (2) Loosely, to *scale*.

**normalized device coordinate.** A device coordinate specified in an intermediate coordinate system and normalized to some range, typically 0 to 1. A *display image* expressed in normalized device coordinates lies in the same relative position on any *device space*.

**normalized form.** (ISO) In a *floating-point representation*, the form taken when the *fixed-point part* lies within some prescribed standard range, so chosen that any given *real number* is represented by a unique pair of *numerals*. Synonymous with *standard form*.

**normal mode rejection.** (ISO) The capability of an amplifier to suppress the effect of the *normal mode voltage*.

**normal mode voltage.** (1) (ISO) The unwanted part of the voltage between the two *input* connection points of an amplifier that is added to the voltage of the original *signal*. (2) See *maximum normal mode voltage*, *maximum operating normal mode voltage*.

**NOR operation.** (ISO) Synonym for *nondisjunction*.

**NOT.** A *logic operator* having the property that if P is a statement, then the NOT of P is true if P is false, false if P is true. The NOT of P is often represented by  $\bar{P}$ ,  $\sim P$ ,  $\neg P$ ,  $P'$ .

**NOT AND.** Synonym for *NAND*.

**notation.** (1) (ISO) A *set of symbols*, and the rules for their use, for the representation of *data*. (2) See *binary notation*, *decimal notation*, *infix notation*, *postfix notation*, *prefix notation*.

**NOT-BOTH operation.** (ISO) Synonym for *nonconjunction*.

**NOT gate.** (ISO) A *combinational circuit* that performs the *Boolean operation of negation*. Synonymous with NOT element.

**NOT element.** (ISO) Synonym for NOT gate.

**NOT-IF-THEN gate.** (ISO) A *combinational circuit* that performs the *Boolean operation of exclusion*. Synonymous with NOT-IF-THEN element.

**NOT-IF-THEN element.** (ISO) Synonym for NOT-IF-THEN gate.

**NOT-IF-THEN operation.** (ISO) Synonym for *exclusion*.

**NOT operation.** (ISO) Synonym for *negation*.

**NOT-OR.** Synonym for *NOR*.

**noughts complement.** (ISO) Synonym for *radix complement*.

**NRZ.** (ISO) *Non-return-to-reference recording*.

**NRZ-1.** *Non-return-to-zero change-on-ones recording*.

**NRZ-I.** *Non-return-to-zero (inverted) recording*.

**NRZ (C).** (ISO) *Non-return-to-zero (change) recording*.

**NRZ (M).** (ISO) *Non-return-to-zero (mark) change-on-ones recording*.

**n-tuple length register.** (ISO) *n registers* that function as a single register.

**n-tuple register.** (ISO) Synonym for *n-tuple length register*.

**nucleus.** (ISO) That part of a *control program* that is *resident* in *main storage*. Synonymous with *resident control program*.

**NUL.** The *null character*.

**null.** (1) Empty. (2) Having no meaning. (3) Not usable. (4) A *data item* or a *record* for which space has been allocated but for which no value currently exists.

**null character (NUL).** A *control character* that may be used as a *filler* and that may be inserted into or removed from a *sequence of characters* without affecting the meaning of the sequence; however, equipment control or *format* may be affected by this character.

**null string.** (1) (ISO) A *string* that contains no elements. (2) The notion of a *string* depleted of its elements, or the notion of a string prior to the establishment of its elements.

**number.** (1) A mathematical *entity* that may indicate quantity or amount of units. (2) Loosely, a *numeral*. (3) See *binary number*, *complex number*, *fibonacci number*, *level number*, *natural number*, *random number*, *rational number*, *real number*, *serial number*.

**number representation.** (ISO) A representation of a *number* in a *numeration system*. Synonymous with *numeration*.

**number representation system.** (ISO) Synonym for *numeration system*.

**number sequence.** See *pseudo-random number sequence*, *random number sequence*.

**numeral.** (1) (ISO) A *discrete representation* of a *number*. The concept of a dozen may be represented by: twelve, a *word* in the *English language*; by 12 in the *decimal numeration system*; by XII in *Roman numeral representation*; and by 1100 in the *pure binary numeration system*. (2) See *binary numeral*, *decimal numeral*.

**numeration.** (ISO) Synonym for *number representation*.



**numeration system.** (1) (ISO) Any *notation* for the representation of *numbers*. Synonymous with number representation system. (2) See *decimal numeration system*, *fixed-radix numeration system*, *mixed-base numeration system*, *mixed-radix numeration system*, *pure binary numeration system*, *radix numeration system*.

**numerical.** Pertaining to *data* or to physical quantities that consist of *numerals*.

**numerical accounting machine.** An *accounting machine* that does not have a means for entering unlimited *alphabetic information*.

**numerical analysis.** The study of methods for obtaining useful quantitative solutions to problems that have been expressed mathematically, including the study of the *errors* and bounds on errors in obtaining such solutions.

**numerical control (NC).** (ISO) *Automatic control* of a process performed by a device that makes use of *numeric data*, usually introduced as the *operation* is in progress.

**numeric character.** (ISO) Synonym for *digit*.

**numeric character set.** (ISO) A *character set* that contains *digits* and that may contain *control characters*,

*special characters*, and the *space character*, but not *letters*.

**numeric code.** (ISO) A *code* whose application results in a *code element set* whose elements are from a *numeric character set*.

**numeric coded character set.** (ISO) A *coded set* whose elements are formed from a *numeric character set*.

**numeric data.** (1) (ISO) *Data* represented by *numerals*. (2) *Data* represented by *numerals* and some *special characters*.

**numeric optical disk.** (ISO) Synonym for *digital optical disk*.

**numeric punch.** A hole punched in one of the *punch rows* designated as zero through nine. A zero-punch, and sometimes an eight- or nine-punch, in combination with another *numeric punch*, is considered a *zone punch*.

**numeric representation.** (ISO) A *discrete representation* of *data* by *numerals*.

**numeric word.** (ISO) A *word* that consists of *digits* and possibly *space characters* and *special characters*; for example, in the Universal Decimal Classification system, the *numeric word* 61(03) = 20 is used as an identifier of any medical encyclopedia in English.



## O

**OA.** Office automation.

**object.** (1) In a *programming language*, a *variable* or a *constant* that can denote any kind of *data element*, whether *scalar* or *composite*. This definition does not pertain to *object-oriented programming*. (2) See *lexical object*, *linguistic object*.

**object code.** Output from a *compiler* or an *assembler* that is *executable computer instruction code* or code that is suitable for further *processing* to produce *executable computer instruction code*.

**object language.** (1) A *language* that is specified by a *metalanguage*. (2) (ISO) Synonym for *target language*.

**object module.** (ISO) A *module* that is the *output* of an *assembler* or a *compiler* and that is suitable for *input* to a *linkage editor*.

**object program.** (ISO) The translated version of a *source program*. Synonymous with *target program*.

**OCR.** Optical character recognition.

**octal.** (1) (ISO) Characterized by a selection, choice, or condition that has eight possible values or states. (2) (ISO) In a *fixed-radix numeration system*, having a *radix* of eight.

**octet.** (ISO) A *byte* composed of eight *binary elements*. Synonymous with *eight-bit byte*.

**office automation (OA).** The techniques and means used for the *automation* of office activities, in particular, the *processing* and communication of *text*, *images*, and *voice*.

**offline.** (ISO) Pertaining to the operation of a *functional unit* that is not under the direct control of a *computer*.

**offline storage.** Storage that is not under the control of a *processing unit*.

**one-dimensional language.** A *language* whose *expressions* are customarily represented as *strings* of *characters*, as in *FORTRAN*, for example.

**ones complement.** (ISO) The *diminished radix complement* in the *pure binary numeration system*. Synonymous with *complement-on-one*.

**one-way communication.** (ISO) *Data communication* such that *data* are transferred in one preassigned direction.

**online.** (1) (ISO) Pertaining to the operation of a *functional unit* that is under the direct control of a *computer*. (2) Pertaining to a *user's* ability to interact with a *computer*. (3) Pertaining to *user access* to a *computer* via a *user terminal*.

**on-the-fly printer.** (ISO) An *impact printer* whose *type slugs* do not stop moving during the *impression time*.

**open-ended.** Pertaining to a *process* or *system* that can be augmented.

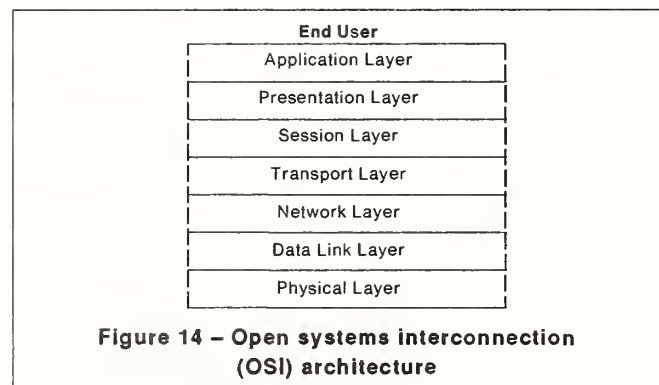
**open shop.** Pertaining to the operation of a *computer facility* in which most productive *problem programming* is performed by the *problem originator* rather than by a group of *programming specialists*. The use of the *computer* itself may also be described as *open shop* if the *user/programmer* also serves as the *operator*.

**open subroutine.** A *subroutine* that must be inserted at each place the subroutine is used in a *computer program*.

**open system.** A *system* whose characteristics comply with readily available standards and that therefore can be connected to other systems that comply with these standards. Contrast with *closed system*.

**open systems interconnection (OSI).** The interconnection of *open systems* in accordance with ISO standards for the exchange of *data*.

**open systems interconnection (OSI) architecture.** (1) (ISO) *Network architecture* that adheres to that particular set of ISO standards that relates to *Open Systems Architecture*. (2) See Figure 14.



**operable time.** (ISO) The time during which a *functional unit* would yield correct results if it were operated. Synonymous with *uptime*.

**operand.** (1) (ISO) An *entity* on which an *operation* is performed.

**operate mode.** (ISO) Synonym for *compute mode*.

**operating voltage indicator.** (ISO) A device that gives a visual *signal* to indicate that the correct voltage is applied to a *line-powered calculator* or that the battery is sufficiently charged in a *battery-powered calculator*.

**operating space.** (ISO) Synonym for *display space*.

**operating system.** (ISO) *Software* that controls the *execution* of *programs*; and that provides services such as *resource allocation*, *scheduling*, *input/output control*, and *data management*. Usually, operating



systems are predominantly software, but partial or complete *hardware* implementations are possible.

**operating time.** (ISO) That part of *operable time* during which a *functional unit* is operated.

**operation.** (1) (ISO) A well-defined action that, when applied to any permissible combination of known *entities*, produces a new entity; for example, the process of addition in arithmetic; in adding five and three to obtain eight, the *numbers* five and three are the *operands*, the *number* eight is the result, and the plus sign is the *operator* indicating that the operation performed is addition. (2) A *program* step, usually specified by the *operation part* of an *instruction*, that is undertaken or executed by a *computer*; for example, addition, multiplication, extraction, comparison, shift, transfer. (3) See *arithmetic operation*, *asynchronous operation*, *auxiliary operation*, *Boolean operation*, *complementary operation*, *computer operation*, *control operation*, *dual operation*, *dyadic operation*, *equivalence operation*, *fixed-cycle operation*, *identity operation*, *logic operation*, *majority operation*, *monadic operation*, *multiplex operation*, *n-adic operation*, *nonequivalence operation*, *nonidentity operation*, *parallel operation*, *real-time operation*, *repetitive operation*, *single-step operation*, *threshold operation*.

**operational amplifier.** (ISO) A high-gain amplifier connected to external elements to perform specific *operations* or *functions*.

**operation code.** (ISO) A representation of the *operation parts* of the *instructions* of a *computer*.

**operation decoder.** A device that selects one or more control channels according to the *operation part* of a *machine instruction*.

**operation part.** (ISO) The part of an *instruction* that specifies the *operation* to be performed. Synonymous with *function part*, *operator part*.

**operations analysis.** (ISO) Synonym for *operations research*.

**operations research (OR).** (ISO) The design of models for complex problems concerning the optimal allocation of available *resources* and the application of mathematical methods for solving those problems. Synonymous with *operations analysis*.

**operation table.** (ISO) A *table* that defines an *operation* by listing all appropriate combinations of values of the *operands* and indicating the result for each of these combinations.

**operator.** (1) (ISO) In *symbol* manipulation, a symbol that represents the action to be performed in an *operation*. (2) A person who operates a machine. (3) See *Boolean operator*, *complementary operator*, *dyadic operator*, *monadic operator*, *quaternary operator*.

**operator console.** (ISO) A *functional unit* that contains devices used for communications between a *computer operator* and a *data processing system*.

**operator control panel.** (ISO) A *functional unit* that contains switches used to control a *computer* or a part of it and that may contain *indicators* that provide *information* on the functioning of the *system*.

**operator part.** (ISO) Synonym for *operation part*.

**optical character reader.** An *optical scanner* that recognizes only predefined *characters*.

**optical character recognition (OCR).** (ISO) *Character recognition* that uses optical means to identify *graphic characters*.

**optical disk.** (ISO) A disk that contains *data readable* by optical techniques. See *digital optical disk*.

**optical mark reading.** (ISO) Synonym for *mark scanning*.

**optical scanner.** (1) (ISO) A *scanner* that uses light for examining patterns. (2) A device that scans optically and usually generates an *analog* or *digital signal*. (3) See also *optical character reader*.

**OR.** (1) A *logic operator* having the property that if P is a statement, Q is a statement, R is a statement, then the OR of P, Q, R is true if at least one statement is true, false if all statements are false. P OR Q is often represented by  $P + Q$ ,  $P \vee Q$ . Synonymous with *Boolean ADD*. (2) *Operations research*. (3) Contrast with *exclusive-OR*.

**order.** (1) A specified arrangement, which in contrast to a *sequence*, need not be linear; for example, the ordering of a hierarchy of *items*. (2) (ISO) To place *items* in an arrangement in accordance with specified rules.

**ordering bias.** The manner and degree by which the *order* of a *set* of *items* departs from random distribution. An ordering *bias* makes the effort necessary to order a set of items more than or less than the effort that would be required for a similar set with random distribution.

**organization.** See *file organization*.

**OR operation.** (ISO) Synonym for *disjunction*.

**oscillating sort.** A *merge sort* in which the *sorts* and *merges* are performed alternately to form one sorted *set*.

**OSI.** *Open systems interconnection*.

**outconnector.** In *flowcharting*, a *connector* that indicates a point at which a *flowline* is broken for continuation at another point.

**output.** (1) (ISO) Pertaining to a device, *process*, or *channel* involved in the production of *data* by a *com-*

puter or by any of its components. (2) (ISO) An *output* state, or *sequence of states*. (3) *Information retrieved* from a *functional unit* or from a *network*, usually after some *processing*.

**output area.** An area of storage reserved for *output*.

**output data.** (ISO) *Data* being produced or to be produced by a device or a *computer program*.

**output channel.** A *channel* for conveying *data* from a device or logic element.

**output device.** (ISO) Synonym for *output unit*.

**output data.** (ISO) *Data* being produced or to be produced by a device or a *computer program*.

**output primitive.** (ISO) Synonym for *display element*.

**output program.** (ISO) A *utility program* that organizes the *output process* of a *computer*.

**output routine.** (ISO) A *utility routine* that organizes the *output process* of a *computer*.

**output subsystem.** (ISO) The part of a *process interface system* that *transfers data* from the *process computer system* to a *technical process*.

**output unit.** (ISO) A device by which *data* can be conveyed out of a *computer*. Synonymous with *output device*.

**overflow.** (1) (ISO) In a *calculator*, the state in which the calculator is unable to accept or *process* the number of *digits* in the entry or in the result. (2) See *arithmetic overflow*.

**overflow check.** (ISO) A *limit check* to determine whether a representation of *data* exceeds a stipulated length.

**overflow indicator.** (ISO) On a *calculator*, a visual indication that the calculator is in an *overflow* state.

**overhead.** In a *computer system*, the time, *operations*, and *resources* used for *operating system functions*, rather than for *application programs*.

**overlay.** (1) (ISO) One of several segments of a *computer program* that, during *execution*, occupy the same area of *main storage*, one segment at a time. (2) To load an *overlay*.

**overlay supervisor.** A *routine* that controls the proper *sequencing* and positioning of segments of *computer programs* in limited storage during their *execution*.

**overpunch.** (ISO) To add holes to a *card column* or to a *tape row* that already contains holes.





## P

**pack.** (1) (ISO) To *store data* in a compact form in a *storage medium* by taking advantage of known characteristics of the data and the storage medium, in such a way that the original form of the data can be recovered; for example, to make use of *bit* or *byte locations* that would otherwise go unused. (2) See *disk pack*.

**packed numeric.** A representation of *numeric values* that compresses each *character* representation in such a way that the original value can be recovered.

**packet.** (ISO) In *data communication*, a *sequence of binary digits*, including *data* and *control signals*, that is transmitted and switched as a composite whole. The data, control signals, and possibly *error control information*, are arranged in a specific format.

**packet assembler/disassembler (PAD).** (ISO) A *functional unit* that enables *data terminal equipments* not equipped for *packet switching* to access a *packet switched network*.

**packet mode terminal.** (ISO) *Data terminal equipment* that can control, format, transmit, and receive *packets*.

**packet sequencing.** (ISO) A *process* of ensuring that *packets* are delivered to the receiving *data terminal equipment* in the same *sequence* as they were transmitted by the sending *data terminal equipment*.

**packet switching.** (ISO) The *process* of routing and transferring *data* by means of *addressed packets* so that a *channel* is occupied only during *transmission* of a *packet*; upon completion of the transmission, the channel is made available for the transfer of other *packets*.

**PAD.** *Packet assembler/disassembler*.

**padding.** (1) (ISO) A technique that incorporates *fillers* into *data*. (2) A technique used to fill a *field*, *record*, or *block* with *dummy data*, usually *zeros* or *spaces*.

**page.** (ISO) In *virtual storage*, a fixed length *block* that has a *virtual address* and that is *transferred* as a unit between *real storage* and *auxiliary storage*. (2) In *text processing*, a predetermined maximum of *lines*, including *line spaces*, forming one sheet after being printed out.

**page control.** (ISO) A capability to operate one *page* at a time, for example, *delete*, *skip*, *move*, *print*.

**page depth.** (ISO) The number of *lines* to be printed on a *page*. Synonymous with *page-end zone*.

**page depth control.** (ISO) A *control function* for specifying *page depth*.

**page-end zone.** (ISO) Synonym for *page depth*.

**page frame.** (1) (ISO) In *real storage*, a *storage location* that has the size of a *page*. (2) An area of *main storage* used to hold a *page*.

**page printer.** (1) (ISO) A *printer* that prints one *page* as a unit; for example, a *computer-output microfilm printer*; a *laser printer*.

**page reader.** A *character reader* whose *input data* are printed *text*.

**page swapping.** The exchange of *pages* between *main storage* and *auxiliary storage*.

**pagination.** In *text processing*, the division of a *document* into *pages*, either by a *user* or *automatically*.

**paging.** (1) (ISO) The *transfer* of *pages* between *real storage* and *auxiliary storage*. (2) An allocation technique by which *main storage* is divided into *page frames*. A *computer program* need not be located in contiguous *page frames* in order to be executed. (3) See *anticipatory paging*, *demand paging*.

**paging device.** An *auxiliary storage device* used primarily to hold *pages*.

**paging technique.** (ISO) A *real storage* allocation technique by which *real storage* is divided into *page frames*.

**panel.** See *control panel*, *maintenance panel*, *operator control panel*.

**panel interface.** A *screen-oriented user interface* designed to permit *interactive processing*.

**panning.** (ISO) A *progressive translation* of an entire *display image* to give a visual impression of lateral movement of the image.

**paper carrier.** (ISO) An arrangement of components for holding and guiding the printing medium in a device.

**paper feed.** (ISO) A device that positions the printing medium as the paper is moved into a printing device.

**paper skip.** (ISO) The movement of paper through a print mechanism at a speed effectively greater than that of individual single line spacing. Synonymous with *paper slew*, *paper throw*.

**paper slew.** (ISO) Synonym for *paper skip*.

**paper throw.** (ISO) Synonym for *paper skip*.

**paper tape code.** Synonym for *perforated tape code*.

**paragraph.** (ISO) In *text processing*, one or more *sentences* that may be preceded or followed by an appropriate indicator.

**paragraph control.** (ISO) In *text processing*, a capability to *process text* one *paragraph* at a time, for example, *skip*, *move*, *delete*, *print*.

**paragraph indent.** (ISO) In *text processing*, a *program instruction* that indents one or more lines of a *paragraph* a preset number of *characters* or a preset distance.

**parallel.** (1) (ISO) Pertaining to a *process* in which all events occur within the same interval of time, each one handled by a separate but similar *functional unit*; for example, the *parallel transmission* of the *bits* of a *computer word* along the lines of an *internal bus*. (2) Contrast with *serial*.

**parallel adder.** (1) (ISO) An *adder* in which addition is performed *simultaneously* on all corresponding *digit places* of the *operands*. (2) Contrast with *serial adder*.

**parallel addition.** (ISO) Addition that is performed *simultaneously* on the *digits* in all *digit places* of the *operands*.

**parallel computer.** (1) A *computer* that has multiple *arithmetic units* or *logic units* that are used to accomplish *parallel operations* or *parallel processing*. (2) Contrast with *serial computer*.

**parallel operation.** (ISO) A *processing mode* in which *operations* are performed in *parallel* in one or more devices. (2) Contrast with *serial operation*.

**parallel processing.** (1) Pertaining to the *concurrent* or *simultaneous execution* of two or more *processes* in a single unit. (2) Contrast with *serial processing*.

**parallel run.** (ISO) A test *run* of a new or an altered *data processing system* with the same *source data* that is used in another system; the other system is considered as the standard of comparison.

**parallel search storage.** A *storage device* in which one or more parts of all *storage locations* may be queried or accessed *simultaneously*.

**parallel-serial converter.** (ISO) Synonym for *serializer*.

**parallel transmission.** (1) (ISO) The *simultaneous transmission* of the *signal elements* of a group representing a *character* or other *data item*. (2) Contrast with *serial transmission*.

**parameter.** (1) (ISO) A *variable* that is given a constant value for a specified application. (2) See *actual parameter*, *external program parameter*, *formal parameter*, *preset parameter*.

**parameter word.** A *word* that directly or indirectly provides or designates one or more *parameters*.

**parenthesis-free notation.** (ISO) Synonym for *prefix notation*.

**parity bit.** (ISO) A *binary digit* appended to a group of binary digits to make the sum of all the *digits*,

including the appended binary digit, either odd or even, as predetermined.

**parity check.** (ISO) A *redundancy check* by which a recalculated *parity bit* is compared to the predetermined parity bit.

**partial carry.** (ISO) In *parallel addition*, a procedure in which some or all of the *carries* are temporarily stored instead of being immediately transferred.

**Pascal.** A general-purpose high-level *procedure-oriented language* with features that support and emphasize *structured programming*, *data structures* with *strong typing*, and *modularity*; its *syntax* is characterized by clarity of expression.

**pass.** See *sort pass*.

**passive station.** (ISO) On a *multipoint connection* or a *point-to-point connection* using *basic mode link control*, any *tributary station* waiting to be polled or selected.

**pass key.** Synonym for *privacy key*.

**password.** (ISO) A *character string* that enables a user to have full or limited access to a *system* or to a set of *data*.

**paste.** See *cut and paste*.

**patch.** (1) (ISO) To make a temporary or expedient modification of a *program* in order to locate and correct an *error*. (2) A temporary electrical connection. (3) To modify an *object program* without recompiling the *source program*.

**path.** (1) (ISO) In a *network*, any route between any two *nodes*. A path may include more than one *branch*. (2) See *access path*, *card path*, *punch path*, *read path*.

**pattern recognition.** (ISO) The identification of shapes, forms, or configurations by *automatic means*.

**pattern sensitive fault.** A *fault* that appears in response to some particular pattern of *data*.

**pause instruction.** An *instruction* that specifies the suspension of the execution of a *computer program*; a pause instruction is usually not an *exit*. Synonymous with *halt instruction*.

**PC.** *Personal computer*.

**PCM.** *Pulse code modulation*.

**PCS.** *Print contrast signal*.

**PEL.** *Picture element*.

**percentage function.** (ISO) In a *calculator*, the *function* that *automatically* multiplies two entered *numbers*, one of which is understood to be a percentage, and divides the results by one hundred.

**perforated tape.** A *tape* on which a pattern of holes or cuts is used to represent *data*.



**perforated tape code.** A code that is used to represent data on *perforated tape*. Synonymous with paper tape code.

**perforated-tape reader.** A device that converts holes or cuts in *perforated tape* into coded electrical pulse patterns.

**peripheral device.** Synonym for *peripheral unit*.

**peripheral node.** (ISO) Synonym for *endpoint node*.

**peripheral unit.** With respect to a particular *processing unit*, any equipment that can communicate directly with that unit. Synonymous with peripheral device.

**permanent storage.** (ISO) A storage device that is nonerasable.

**permissible action.** In a *conceptual schema language*, an action conforming to specified rules and constraints that may change or reveal the presence of a presumably consistent collection of *sentences* in the *information base* or in the *conceptual schema*.

**permutation.** An ordered arrangement of a given number of different elements selected from a set.

**perpendicular magnetic recording.** (ISO) A technique of *magnetic recording* in which magnetic polarities representing data are aligned perpendicularly to the plane of the recording surface. Synonymous with vertical magnetic recording.

**personal computer (PC).** A *microcomputer* intended for use by an individual for professional or private purposes.

**phase.** See *assembly phase*, *compile phase*, *execute phase*, *translate phase*.

**phase encoding.** Synonym for *phase modulation recording*.

**phase modulation recording.** (1) (ISO) A *magnetic recording* in which each storage cell is divided into two regions that are magnetized in opposite senses; the sequence of these senses indicates whether the *binary character* represented is zero or one. Synonymous with phase encoding. (2) See Figure 15.

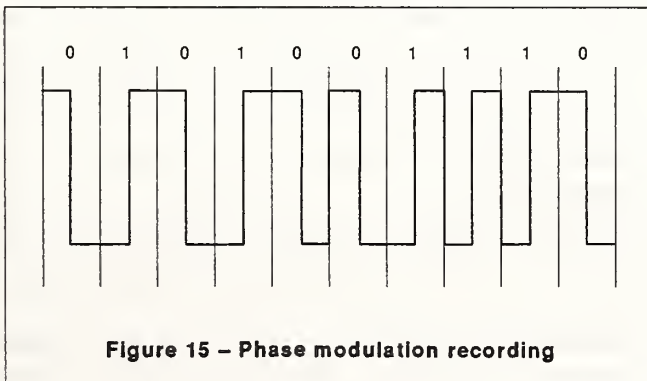


Figure 15 - Phase modulation recording

**photocomposer.** Synonym for *phototypesetter*.

**phototypesetter.** (ISO) A *nonimpact printer* that creates characters through photography. Synonymous with photocomposer.

**physical.** (1) Pertaining to actual implementation or location as opposed to conceptual content or meaning. (2) Pertaining to the representation and storage of data on a medium such as *magnetic disk*, or to a description of data that depends on physical factors such as length of *data elements*, *records*, or *pointers*. (3) Contrast with *logical*.

**physical data structure.** The form in which data are stored on a medium.

**physical level.** In a *conceptual schema language*, the level that is or that describes something that has a direct existence or is a realization of an *information system*. Contrast with *logical level*.

**physical recording density.** (ISO) The number of characters stored per unit of length, area, or volume; the number is generally expressed in characters per millimeter, or characters per radian. On *disks*, total storage capacity is usually specified, rather than data density.

**physical schema.** A *schema* that defines a *data structure*.

**pick device.** (ISO) An *input unit* that is used to specify a particular *display element* or segment; for example, a *light pen*.

**picture.** (ISO) In a *programming language*, a *language construct* that describes a *data type* by means of model character string literals; for example, 9999 may be used to describe any 4-digit numeric word.

**picture element (PEL).** Synonym for *pixel*.

**picture processing.** Synonym for *image processing*.

**pilot project.** (ISO) A project to develop a limited version of a *system* to be used under restricted, yet real, conditions to gain experience for the development of a full-scale system.

**pinboard.** (ISO) Synonym for *plugboard*.

**pin pad.** (ISO) A pad with twelve keys in a specific arrangement that *display alphabetic* and *numeric characters* that may be entered onto a financial transaction terminal.

**pipeline processor.** (ISO) A *processor* in which execution of *instructions* takes place as a series of units, arranged so that several units can be *simultaneously processing* appropriate parts of several instructions.

**pitch.** (1) The unvarying width of the *escapement* of all *graphic characters* in a given font. (2) See *feed pitch*, *fixed pitch*, *row pitch*, *track pitch*. (3) See also *proportional spacing*.



**pixel.** (ISO) The smallest element of a *display surface* that can be independently assigned color or intensity. Synonymous with picture element (PEL).

**PLA.** *Programmable logic array.*

**plasma panel.** (ISO) A part of a *display device* that consists of a grid of electrodes in a flat, gas-filled panel. The image can persist for a long period of time without *refresh*. Synonymous with gas panel.

**plated wire storage.** (ISO) A *magnetic storage* in which *data* are stored by *magnetic recording* on a film coated on the surface of wire.

**playback.** (ISO) In *text processing*, the *output of text* from a *recording medium*. Synonymous with *playout*, *printout*.

**playout.** (ISO) Synonym for *playback*.

**PL/I.** A *programming language* that is designed for use in a wide range of commercial and scientific *computer applications*.

**plotter.** (1) (ISO) An *output unit* that presents *data* in the form of a two-dimensional graphic representation. (2) See *drum plotter*, *flatbed plotter*.

**plotter step size.** (ISO) The incremental size on a *plotter*.

**plotting head.** (ISO) That part of a *plotter* that is used to create marks on a *display surface*.

**plugboard.** A perforated board into which plugs or pins may be inserted to control the operation of equipment. Synonymous with control panel, pinboard.

**plugboard chart.** A chart that shows, for a given job, where plugs or pins may be inserted into a *plugboard*.

**pocket.** (ISO) A *card stacker* in a *card sorter*.

**pocket calculator.** (ISO) Synonym for *hand-held calculator*.

**pointer.** (1) A *data element* that represents an *address* or *location* of a related *stored record* in a *file*. (2) An *identifier* that indicates the *location* of a *data item*.

**point-of-sale device.** A device for recording sales *data* on *machine-readable* media at the time each sale is made.

**point-to-point connection.** (ISO) A *connection* established between two *data stations* for *data transmission*; the connection may include switching facilities.

**polarized return-to-zero recording (RZ(P)).** (1) (ISO) *Return-to-zero recording* in which the zeros are represented by magnetization in one sense and the ones are represented by magnetization in the opposite sense; the reference condition is the absence of magnetization. (2) See Figure 16.

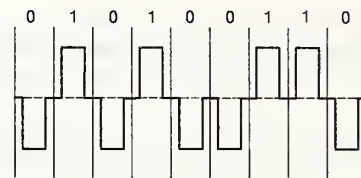


Figure 16 – Polarized return-to-zero recording

**Polish notation.** (ISO) Synonym for *prefix notation*.

**polling.** (1) (ISO) On a *multipoint connection*, or on a *point-to-point connection*, the process whereby *data stations* are invited one at a time to transmit. (2) Interrogation of devices for purposes such as to avoid *contention*, to determine operational status, or to determine readiness to send or receive *data*.

**polyphase sort.** An *unbalanced merge sort* in which the distribution of sorted *subsets* is based on a *fibonacci series*.

**portability.** (1) The ability to *transfer data* from one *system* to another without being required to recreate or reenter *data descriptions* or to significantly modify the application being transported. (2) The ability of *software* or of a *system* to run on more than one type or size of *computer* or under more than one *operating system*. (3) Synonymous with *transportability*.

**position.** (1) (ISO) In a *string*, each location that may be occupied by a *character* or *binary element* and that may be identified by a *serial number*. (2) See *bit position*, *display position*, *printing position*, *punch position*, *sign position*, *typing position*.

**positional notation.** (ISO) Synonym for *positional representation system*.

**positional representation.** (ISO) A representation of a *real number* in a *positional representation system*.

**positional representation system.** (ISO) Any *numeration system* in which a *real number* is represented by an *ordered set of characters* in such a way that the value contributed by a character depends upon its position as well as upon its value. Synonymous with *positional notation*.

**positioning time.** (1) (ISO) Synonym for *seek time*. (2) See Figure 1.

**postamble.** (ISO) A sequence of *bits* recorded at the end of each *block* on a magnetic medium for the purpose of synchronization when reading backward.

**post-development review.** (ISO) Synonym for *system follow-up*.

**postfix notation.** (1) (ISO) A method of forming mathematical expressions in which each *operator* is preceded by its *operands* and indicates the *operation* to be performed on the operands or the intermediate results that precede it. For example, (a) A added to B and the sum multiplied by C is represented by the expression  $AB + CX$ . (b) P AND the result of Q AND R is represented by the expression  $PQR\&\&$ . (2) Synonymous with reverse Polish notation, suffix notation. (3) Contrast with *infix notation*, *prefix notation*.

**post-implementation review.** (ISO) Synonym for *system follow-up*.

**posting.** See *event posting*.

**postmortem dump.** (ISO) A *dump* that is performed at an *abnormal termination* of a *run*, usually for purposes of *debugging*.

**postprocessor.** A computer program that effects some final computation or organization.

**potentiometer set mode.** (ISO) That setup mode of an *analog computer* during which the coefficients of a problem are set.

**power typing.** In *text processing*, high-speed entry of text that is to be corrected and *printed* later.

**pragmatics.** (1) (ISO) The relationships of *characters*, or groups of characters, to their interpretation. (2) See also *semantics*, *syntax*.

**preamble.** (1) (ISO) In a *local area network*, a specified *bit* pattern transmitted by a *data station* that precedes the *transmission frame* in order to establish synchronization with other stations. (2) (ISO) A sequence of *bits* recorded at the beginning of each *block* on a *magnetic tape* for the purpose of synchronization.

**precision.** (1) (ISO) A measure of the ability to distinguish between nearly equal values; for example, four-place *numerals* are less precise than six-place numerals; nevertheless, a properly computed four-place numeral may be more accurate than an improperly computed six-place numeral. (2) The degree of discrimination with which a quantity is stated; for example, a three-digit *numeral* discriminates among 1000 possibilities. (3) See *double-precision*, *multiple-precision*, *single-precision*, *triple-precision*.

**predefined process.** In a *flowchart*, a *process* that is identified only by name and that is defined elsewhere.

**predicate.** In a *conceptual schema language*, a *linguistic object*, analogous to a verb, that may specify an *attribute* or *action* concerning one or more *entities* in the *universe of discourse*.

**prefix notation.** (1) (ISO) A method of forming mathematical expressions in which each *operator* precedes its *operands* and indicates the *operation* to be per-

formed on the operands or on the intermediate results that follow the operation. For example, (a) A added to B and the sum multiplied by C is represented by the expression  $X + ABC$ . (b) P AND the result of Q AND R is represented by the expression  $\&P\&QR$ . Synonymous with Lukasiewicz notation, parenthesis-free notation, Polish notation. (2) Contrast with *infix notation*, *postfix notation*.

**P register.** (ISO) Synonym for *instruction address register*.

**preprocessor.** (ISO) A *functional unit* that effects preparatory computation or organization.

**pre-read head.** (ISO) A *read head* placed adjacent to another read head and used to read *data* before the same data are read by the other read head.

**prerecorded data medium.** (ISO) A *data medium* on which certain preliminary *items of data* are present; the remaining items of data are entered during subsequent *operations*.

**preset.** To establish an initial condition, such as the control values of a *loop*, or the value to which a *parameter* is to be bound.

**preset parameter.** A *parameter* that is bound when a computer program is constructed, coded, or compiled.

**prestore.** To store *data* that are required by a computer program before the program is entered.

**presumptive instruction.** An *instruction* that does not become effective until it has been modified in a prescribed manner.

**preventive maintenance.** (ISO) *Maintenance* performed specifically to prevent *faults* from occurring.

**preventive maintenance time.** Time, usually scheduled, used to perform *preventive maintenance*.

**primary account number.** (ISO) On an *identification card* for financial transactions, an identifier that consists of two parts; the first identifies the issuer of the card; the second identifies an individual.

**primary key.** A *key* that unambiguously identifies a *record*.

**primary station.** (ISO) In *high-level data link control*, the part of the *data station* that supports the primary *control functions* of the *data link*, generates commands for *transmission*, and interprets received responses. Specific responsibilities assigned to the primary station include initialization of control *signal* interchange, organization of *data flow*, and actions regarding *error control* and *error recovery* functions.

**primary storage.** Synonym for *main storage*.

**100% principle.** In a *conceptual schema language*, all general, static, and dynamic rules of the *universe of*



*discourse* that are described in the *conceptual schema*.

**print bar.** (ISO) Synonym for *type bar*.

**print contrast ratio.** In *optical character recognition*, the ratio obtained by subtracting the reflectance at an inspection area from the maximum reflectance found within a specified distance from that area, and dividing the result by that maximum reflectance.

**print contrast signal (PCS).** In *optical character recognition*, a measure of the contrast between a printed character and the paper on which the character is printed.

**print control character.** A control character for print operations such as line spacing, page ejection, or carriage return.

**print drum.** (ISO) A rotating cylinder that presents characters at more than one printing position.

**printed card form.** The layout or format for the printed matter on a card; the printed matter usually describes the purpose of the card and designates the precise locations of card fields.

**printer.** (1) (ISO) An output unit that produces a hard copy record of data mainly in the form of discrete graphic characters that belong to one or more predetermined character sets. (2) See *band printer, bar printer, belt printer, bidirectional printer, chain printer, character printer, computer output microfilm printer, daisy wheel printer, dot-matrix printer, drum printer, electrostatic printer, impact printer, ink jet printer, laser printer, letter-quality printer, line printer, magnetographic printer, matrix printer, nonimpact printer, on-the-fly printer, page printer, reader-printer, thermal printer*.

**printing calculating machine.** A calculating machine that can print one or more of the significant elements of a computation.

**printing calculator.** (ISO) A calculator in which the data output is printed on paper or other suitable material.

**printing line.** The writing line on a printer.

**printing position.** The imprint position on a printer.

**printout.** Synonym for *playback*.

**print through.** (ISO) An undesired transfer of a recorded signal from one part of a magnetic medium to another part when these parts are brought into close proximity.

**print wheel.** (ISO) A rotating disk that presents all the characters of a set at a single printing position.

**priority interrupt.** Temporary suspension of the execution of a computer program to permit execution of

another program or part of a program of higher priority.

**priority processing.** A method of operating a computer so that the programs are executed in such a way that the order of processing is fully determined by a system of priorities.

**privacy key.** In a database management system, a password, a data item, or a procedure defined to identify users and to verify their authority to access specific portions of a database and to perform specific operations on the stored data. Synonymous with access control key, pass key.

**privacy lock.** (1) In a database management system, the facility specified to control access to a database in such a way that only authorized users may access specified portions of the database and perform only those operations on the stored data authorized specifically by the lock. (2) A facility specified as a literal, a data item, or a procedure used to prevent an operation from proceeding unless the matching privacy key is presented. (3) Synonymous with access lock, access control lock.

**privacy protection.** (ISO) The establishment and enforcement of appropriate administrative, technical, and physical safeguards to ensure the security and confidentiality of data records and to protect both security and confidentiality against any threat or hazard that could result in substantial harm, embarrassment, inconvenience, or unfairness to any individual about whom such information is maintained.

**privileged instruction.** (ISO) An instruction that can be executed only in a specific mode, usually by a supervisory program.

**problem definition.** (ISO) A statement of a problem, which may include a description of the method, the procedures, and algorithms used to solve the problem. Synonymous with problem description.

**problem description.** (ISO) Synonym for *problem definition*.

**problem-oriented language.** (ISO) A programming language that is especially suitable for a given class of problems.

**problem throughput.** A measure of the average time required for processing a problem or a batch of problems.

**problem time.** In simulation, a measure of the duration of a process, or the length of time between two specified events of a process.

**procedure.** In programming languages, a block that can be executed within a predetermined period of time.



**procedure call.** (1) In *programming languages*, a *language construct* that specifies an invocation of a *procedure*. (2) The description of the course of action taken for the solution of a problem.

**procedure-oriented language.** A *problem-oriented language* that facilitates the expression of procedures as explicit *algorithms*; for example, *FORTRAN*, *ALGOL*, *COBOL*, *PL/I*. Synonymous with imperative language.

**process.** (1) (ISO) To perform operations on data. (2) A course of events defined by its purpose or by its effect, achieved under given conditions. (3) See *pre-defined process*.

**process computer system.** (ISO) A computer system, with a *process interface system*, that monitors or controls a *technical process*.

**process control.** (ISO) Automatic control of a process, in which a computer system is used to regulate the usually continuous operations or processes.

**process control equipment.** (ISO) Equipment that measures the *variables* of a *technical process*, directs the process according to control signals from the process computer system, and provides appropriate signal transformation; for example, equipment such as actuators, sensors, and transducers.

**process control system.** (ISO) A computer system, process control equipment, and possibly a process interface system. The process interface system may be part of a special purpose computer.

**processing.** See *automatic data processing*, *background processing*, *batch processing*, *data processing*, *foreground processing*, *list processing*, *multiprocessing*, *priority processing*, *remote batch processing*, *transaction processing*.

**processing system.** See *data processing system*.

**processing unit.** (ISO) A functional unit that consists of one or more processors and their internal storage.

**process interface system.** (ISO) A functional unit that adapts process control equipment to the computer system in a process computer system.

**process interrupt signal.** (ISO) A signal that originates from a technical process and that causes an interrupt in the process computer system.

**processor.** (1) (ISO) In a computer, a functional unit that interprets and executes instructions. A processor consists of at least an instruction control unit and an arithmetic unit. (2) See *array processor*, *information processor*, *language processor*, *multiprocessor*, *pipeline processor*, *vector processor*.

**production time.** See *program production time*, *system production time*.

**program.** (1) (ISO) A sequence of instructions suitable for processing. Processing may include the use of an assembler, a compiler, an interpreter, or another translator to prepare the program for execution; the instructions may include statements and necessary declarations. (2) (ISO) To design, write, and test programs. (3) In *programming languages*, a set of one or more interrelated modules capable of being executed. (4) Loosely, a routine. (5) Loosely, to write a routine. (6) See *application program*, *assembly program*, *checking program*, *compiling program*, *control program*, *diagnostic program*, *editor program*, *input program*, *library program*, *monitor program*, *object program*, *output program*, *reentrant program*, *relocatable program*, *reusable program*, *self-adapting program*, *snapshot program*, *sort program*, *source program*, *supervisory program*, *trace program*, *utility program*.

**program block.** In *problem-oriented languages*, a computer program subdivision that serves to group related statements, delimit routines, specify storage allocation, delineate the applicability of labels, or segment parts of the program for other purposes.

**program counter.** A register in the processing unit that steps a computer through a program.

**program development time.** That part of operating time that is used for debugging.

**program execution time.** The interval during which the instructions of a program are executed.

**program instruction.** (ISO) An instruction code that causes one or more functions to be performed automatically.

**program library.** (ISO) An organized collection of programs, or parts of programs, and possibly other information pertaining to their processing.

**programmable.** Pertaining to a device that can accept instructions that alter its basic functions.

**programmable calculator.** (ISO) A calculator whose program can be changed by the operator.

**programmable logic array (PLA).** An array of gates whose interconnections can be programmed to perform a specific logical function.

**program loader.** See *initial program loader*.

**programmable read-only memory (PROM).** (ISO) A storage device that, after being written once, becomes a read-only memory.

**programmable terminal.** Synonym for *intelligent terminal*.

**programmed check.** A check procedure that is a part of a computer program.

**programmer.** A person who designs, writes, and tests computer programs.

**programming.** (1) (ISO) The designing, writing, and testing of computer programs. (2) See *automatic programming, convex programming, dynamic programming, integer programming, linear programming, macroprogramming, mathematical programming, microprogramming, minimum delay programming, multiprogramming, nonlinear programming, quadratic programming.*

**programming environment.** (ISO) An integrated collection of hardware and software designed for use in developing programs. Synonymous with programming system.

**programming language.** (ISO) An artificial language that is designed to generate or to express programs.

**programming module.** A discrete identifiable set of instructions, usually processed as a unit, by an assembler, a compiler, a linkage editor, a loading routine, or other subroutine.

**programming system.** (1) One or more programming languages and the software necessary for using these languages with particular automatic data processing equipment. (2) (ISO) Synonym for *programming environment.*

**program origin.** See *computer program origin.*

**program parameter.** See *external program parameter.*

**program production time.** (ISO) That part of system production time during which a user's computer program is successfully executed.

**program register.** (ISO) Synonym for *instruction address register.*

**program run.** (ISO) The performance of one or more programs.

**program-sensitive fault.** (ISO) A fault that is revealed as a result of the execution of some particular sequence of instructions.

**program test time.** (ISO) That part of system production time during which a user's computer program is tested.

**project.** (ISO) An undertaking with prescribed objectives, magnitude, and duration.

**project control.** (ISO) The activities concerned with monitoring the progress of a project, its direction, quality, and resource utilization, as compared to project plans.

**project management.** (ISO) The activities concerned with project planning and project control.

**project planning.** (ISO) The activities concerned with the specification of the components, timing, resources, and procedures of a project.

**project specification.** (ISO) A specification of the aim, requirements, scope, and limitations of a project and its relationships to other projects.

**Prolog.** (programming in logic). A high-level *applicative programming language* for rule-based or logic programming, oriented to action when declared conditions are met; it is used for *artificial intelligence applications*, particularly *expert systems*, and is based on the first-order predicate calculus of mathematical logic.

**PROM.** *Programmable read-only memory.*

**prompt.** (ISO) A visual or audible message sent by a program to request the user's response.

**proper subset.** A subset that does not include all the elements of a particular set.

**property.** See *entity-integrity property.*

**proportional spacing.** (ISO) A function that spaces characters horizontally in relationship to their different widths. See also *monospacing.*

**proposition.** (1) A conceivable state of affairs concerning entities about which it is possible to assert or deny that such a state of affairs holds for those entities. (2) See *necessary proposition.*

**proposition world.** In a *conceptual schema language*, a collection of *propositions* each of which holds for a given entity world.

**protected location.** A storage location whose contents are protected against accidental alteration, improper alteration, or unauthorized access.

**protection.** (1) (ISO) An arrangement for restricting access to or use of all, or part, of a computer system. Synonymous with *lock out.* (2) See *data protection, privacy protection, storage protection.*

**protocol.** (ISO) A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication.

**prototype.** (ISO) A model suitable for evaluation of system design, performance, and production potential.

**pseudocode.** An artificial language that is used to describe computer program algorithms without using the syntax of any particular programming language. Synonymous with *structured English.*

**pseudorandom number sequence.** (ISO) An ordered set of numbers that has been determined by some defined arithmetic process but is effectively a random number sequence for the purpose for which it is required.



**pulse.** (1) (ISO) A variation in the value of a magnitude, short in relation to the time schedule of interest, the final value being the same as the initial value. Synonymous with impulse. (2) See *clock pulse*, *synchronization pulses*.

**pulse repetition rate.** The number of *pulses* per unit of time.

**pulse string.** (ISO) Synonym for *pulse train*.

**pulse train.** (ISO) A series of *pulses* having similar characteristics. Synonymous with *pulse string*.

**punch.** (1) (ISO) A device for making holes in some kinds of *data media*. (2) A perforation, as in a *punched card* or *paper tape*. (3) See *automatic-feed punch*, *card punch*, *calculating punch*, *eleven punch*, *gang punch*, *hand-feed punch*, *keyboard punch*, *keypunch*, *numeric punch*, *reproducing punch*, *spot punch*, *summary punch*, *tape punch*, *twelve punch*, *zone punch*.

**punch card.** (ISO) A card into which hole patterns can be *punched*.

**punch column.** (1) A line of *punch positions* parallel to the *Y-datum line* of a card. (2) A line of *punch positions* along a *card column*.

**punched card.** (ISO) A card punched with *hole patterns*.

**punched card reader.** (ISO) Synonym for *card reader*.

**punched tape.** (ISO) A tape punched with *hole patterns*.

**punched tape reader.** (ISO) An *input unit* that senses the *hole patterns* in a *punched tape*, transforming the hole patterns to *electrical signals* for representing *data*.

**punching.** See *interstage punching*, *multiple punching*.

**punching position.** (ISO) Synonym for *punch position*.

**punch station.** (ISO) The place in a *punch* where a *data medium* is punched.

**punch path.** (ISO) In a *punch*, a *card path* that has a *punch station*.

**punch position.** (ISO) A defined location on a *data medium* where a hole may be punched to record *data*. Synonymous with *code position*, *punching position*.

**punch tape.** (ISO) A tape in which *hole patterns* can be punched.

**punctuation capability.** (ISO) In a *calculator*, the ability to divide *displayed* or *printed numbers* into groups of three *digits* to the left of the *decimal marker*.

**pure binary numeration system.** (1) (ISO) The *fixed-radix numeration system* that uses the *binary digits* and a *radix* of 2; for example, in this numeration system, the *numeral* 110.01 represents the *number* six and one quarter, that is:

$$1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 + 0 \times 2^{-1} + 1 \times 2^{-2}.$$

(2) Synonymous with *binary numeration system*.

**pushdown list.** (ISO) A *list* that is constructed and maintained so that the next *data item* to be retrieved is the most recently *stored* item in the list; this method is characterized as *last-in-first-out*. Synonymous with *stack*.

**pushdown stack.** (ISO) Synonym for *pushdown list*.

**pushdown storage.** (ISO) A *storage device* in which *data* are ordered in such a way that the next *data item* to be *retrieved* is the item most recently *stored*; this method is characterized as *last-in-first-out*. Synonymous with *stack storage*.

**pushup list.** (ISO) Synonym for *queue*.

**pushup storage.** (ISO) A *storage device* in which *data* are ordered in such a way that the next *data item* to be *retrieved* is the item earliest *stored*; this method is characterized as *first-in-first-out*.





# Q

**quadratic programming.** (ISO) In *operations research*, a particular case of *nonlinear programming* in which the *function* to be maximized or minimized is a quadratic function and the constraints are linear functions.

**quadruple-length register.** (ISO) Four *registers* that function as a single register. Synonymous with quadruple register.

**quadruple register.** (ISO) Synonym for *quadruple-length register*.

**quad tabulation.** (ISO) In *text processing*, a *function* that aligns a *character* or group of characters at any point within a *column*.

**qualified name.** A *data* name explicitly accompanied by a specification of the class to which it belongs in a specified classification system.

**quality assurance.** (1) (ISO) The planned systematic activities necessary to ensure that a component, *module*, or *system* conforms to established technical *requirements*. (2) All actions that are taken to ensure that a development or organization delivers products that meet performance requirements and adhere to standards and procedures. (3) The policy, procedures, and systematic actions established in an enterprise for the purpose of providing and maintaining some degree of confidence in *data integrity* and *accuracy* throughout the life cycle of the *data*, which includes *input*, update, manipulation, and *output*.

**quantization.** (ISO) The subdivision of the range of a *variable* into a finite number of nonoverlapping intervals that are not necessarily of equal width, and the designation of each interval by an assigned value within the interval; for example, a person's age is quantized for most purposes with a quantum of one year.

**quantize.** (ISO) To subdivide the range of a *variable* into a finite number of nonoverlapping intervals that are not necessarily of equal width, and to designate each interval by an assigned value within the interval; for example, a person's age is quantized for most purposes with a quantum of one year.

**quaternary operator.** (ISO) An *operator* that requires exactly four *operands*.

**quarter-squares multiplier.** (ISO) An *analog multiplier* whose operation is based on the identity:

$$xy = [(x + y)^2 - (x - y)^2]/4$$

incorporating *inverters*, *analog adders*, and *square-law function generators*.

**quartet.** (ISO) A *byte* composed of four *binary elements*. Synonymous with four-bit byte.

**quasistable state.** (ISO) Synonym for *unstable state*.

**query language.** In *database management systems*, a *language* that enables an *end user* to interact directly with the *database management system*, and to *retrieve* and possibly modify *data* stored in a *database*.

**queue.** (1) (ISO) A *list* that is constructed and maintained so that the next *data element* to be *retrieved* is the one that is *stored* first; this method is characterized as *first-in-first-out*. Synonymous with pushup list. (2) See *double-ended queue*.

**queued access method.** Any *access method* that synchronizes the *transfer* of *data* between the *computer program* using the access method and the *input/output units*, thereby minimizing delays for *input/output operations*.

**quiescing.** The *process* of bringing a device or a *system* to a halt by rejection of new requests for work.

**quinary.** See *biquinary code*.

**quintet.** (ISO) A *byte* composed of five *binary elements*. Synonymous with five-bit byte.





# R

**radial transfer.** The *process* of transmitting *data* between a *peripheral unit* and a unit of equipment that is more central than that peripheral unit.

**radix.** (1) (ISO) In a *radix numeration system*, the positive *integer* by which the *weight* of a *digit place* is multiplied to obtain the *weight* of the digit place with the next higher weight; for example, in the *decimal numeration system* the radix of each digit place is 10, while in the *biquinary code* the radix of each fives position is 2. (2) Contrast with *base*.

**radix complement.** (1) (ISO) A complement obtained by subtracting each *digit* of a given *number* from the number that is one less than the *radix* of that *digit place*, then adding one to the least significant digit of the result and *executing* any *carries* required; for example, 830 is the tens, that is, the radix complement of, 170 in the *decimal numeration system* using three digits. Synonymous with *noughts complement*. (2) See *diminished radix complement*.

**radix-minus-one complement.** (ISO) Synonym for *diminished radix complement*.

**radix notation.** (ISO) Synonym for *radix numeration system*.

**radix numeration system.** (1) (ISO) A *positional representation system* in which the ratio of the *weight* of any one *digit place* to the weight of the digit place with the next lower weight is a positive *integer*. The permissible values of the *character* in any digit place range from zero to one less than the *radix* of that digit place. Synonymous with *radix notation*. (2) See *mixed-radix numeration system*.

**radix point.** (ISO) In a representation of a *number* expressed in a *radix numeration system*, the location of the separation of the *characters* associated with the integral part from those associated with the fractional part.

**RAM.** *Random-access memory*.

**random access.** (1) An access mode in which specific *logical records* are obtained from, or placed into, a *mass storage file* in a manner independent of the *locations* of other records. (2) Pertaining to the organization and *access method* for a *storage structure* in which *locations* of records are determined by a randomizing or *hashing algorithm* applied to the values of their *keys* so that the *random numbers* thus generated serve as *addresses* of the records. (3) Deprecated term for *direct access*.

**random access memory (RAM).** High speed *read/write memory* with an *access time* that is the same for all *storage locations*.

**random number.** (1) (ISO) A *number* selected from a known set of numbers in such a way that each number in the set has the same probability of occurrence. (2) A *number* obtained by chance. (3) One of a *sequence* of *numbers* considered appropriate for satisfying certain statistical tests or believed to be free from conditions that might bias the result of a calculation.

**random number sequence.** (1) (ISO) A *sequence* of *numbers* each of which cannot be predicted only from a knowledge of its predecessors. (2) See *pseudorandom number sequence*.

**random-walk method.** In *operations research*, a variance-reducing method of problem analysis in which experimentation with probabilistic *variables* is traced to determine results of a significant nature.

**range.** (ISO) Synonym for *span*.

**range check.** (ISO) A *limit check* in which both high and low values are stipulated.

**range specification.** (ISO) In *text processing*, specification by a user of a particular span of text that is to be edited.

**rank.** (ISO) Synonym for *level number*.

**raster.** The coordinate grid that divides the *display* area of a *display device*.

**raster display device.** (ISO) A *display device* in which the *display elements* of a *display image* are generated on the *display surface* by *raster graphics*.

**raster graphics.** (ISO) *Computer graphics* in which a *display image* is composed of an *array* of *pixels* arranged in *rows* and *columns*.

**raster plotter.** A *plotter* that generates a *display image* on a *display surface* using a line-by-line scanning technique.

**raster unit.** (ISO) The unit of measure determined by the distance between adjacent *pixels*.

**rate.** See *data signaling rate*, *pulse repetition rate*, *refresh rate*.

**ratio.** See *error ratio*, *print contrast ratio*, *read-around ratio*, *residual error ratio*.

**rational number.** (ISO) A *real number* that is the quotient of an *integer* divided by an integer other than zero.

**read.** (1) (ISO) To obtain *data* from a *storage device*, from a *data medium*, or from another source. (2) See *destructive read*, *nondestructive read*.

**read-around ratio.** The number of times a specific spot, *digit*, or *location* in *electrostatic storage* may be consulted before spillover of electrons causes a loss of *data* stored in surrounding spots. The surrounding

data must be restored before the deterioration results in any loss of data.

**read cycle time.** (ISO) The minimum time interval between the starts of successive *read* cycles of a *storage device* that has separate reading and *writing* cycles.

**reader.** (1) (ISO) In *text processing*, a device that converts *coded information* on a *recording medium* into a *machine-readable* form. (2) In *micrographics*, a device that enlarges *microimages* for viewing. (3) See *card reader*, *character reader*, *perforated-tape reader*.

**reader-printer.** In *micrographics*, a device that performs the *functions* of a *reader* and a *printer* to produce *hard copy* enlargements of selected *microimages*.

**read head.** (ISO) A *magnetic head* capable of *reading* only.

**reading.** (ISO) The acquisition or interpretation of *data* from a *storage device*, from a *data medium*, or from another source.

**read-only memory (ROM).** Synonym for *ROM*.

**read-only storage.** A *storage device* whose contents cannot be modified, except by a particular *user*, or when operating under particular conditions; for example, a *storage device* in which *writing* is prevented by a lock out. Synonymous with *fixed storage*.

**read path.** (ISO) In a *reader*, the path that has a *read station*.

**read station.** (1) (ISO) The location in a *reader* where the *data* on a *data medium* are *read*. (2) Synonymous with *sensing station*.

**read/write head.** (ISO) A *magnetic head* capable of *reading* and *writing*.

**read/write opening.** (ISO) Synonym for *read/write slot*.

**read/write slot.** (ISO) An opening in the jacket of a *diskette* to allow access to the *read/write heads*. Synonymous with *read/write opening*.

**real address.** (ISO) The *address* of a *storage location* in *real storage*.

**realm.** In the *CODASYL model*, synonym for *area* (2).

**real number.** (ISO) A *number* that may be represented by a finite or infinite *numeral* in a *fixed-radix numeration system*.

**real storage.** (ISO) The *main storage* in a *virtual storage system*. Physically, *real storage* and *main storage* are identical; conceptually, however, *real storage* represents only a part of the range of *addresses* available to the *user* of a *virtual storage*

*system*. Traditionally, the total range of *addresses* available to the *user* was provided by *main storage*.

**real time.** (ISO) Pertaining to the *processing* of *data* by a *computer* in connection with another *process* outside the *computer* according to time requirements imposed by the outside process. This term is also used to describe *systems* operating in *conversational mode* and processes that can be influenced by human intervention while they are in progress.

**real-time operation.** (ISO) In *analog computing*, operation in the *computer mode*, during which the *time scale factor* is one.

**real-time simulation.** The operation of a *simulator* such that the *time scale factor* is equal to one for a physical time specified by the *system* being simulated and by the corresponding *computer time* of the *simulator*.

**reasonableness check.** (ISO) A check to determine whether a value conforms to specified criteria.

**receiver-transmitter.** See *universal receiver-transmitter*.

**reception congestion.** A *network congestion* condition that may occur at a *data switching exchange*.

**recognition.** See *character recognition*, *magnetic ink character recognition*, *optical character recognition*, *pattern recognition*.

**recognition time.** (ISO) The time elapsed between the change of the value of a *digital input signal* and its recognition by a *digital input unit*.

**reconstitution.** (ISO) Synonym for *reconstruction*.

**reconstruction.** (ISO) The restoration of *data* to a previously known or specified state. Synonymous with *reconstitution*.

**record.** (1) (ISO) A group of related *data elements* treated as a unit. (2) A named and usually ordered collection of zero or more *data items* and *data aggregates* that represent the occurrence of a set of *data values* that describe the *attributes* of a particular *entity*. (3) In *programming languages*, an aggregate that consists of *data objects*, each of which may be uniquely referenced by its own *identifier*. (4) See *logical record*, *root record*, *stored record*, *variable-length record*.

**recording.** See *double-pulse recording*, *electron-beam recording*, *magnetic recording*, *non-polarized return-to-zero recording*, *non-return-to-reference recording*, *non-return-to-zero recording*, *non-return-to-zero (change) recording*, *non-return-to-zero (change-on-ones) recording*, *polarized return-to-zero recording*, *return-to-reference recording*, *return-to-zero recording*.



**recording density.** The number of *bits* in a single linear *track* measured per unit of length of the *recording medium*.

**recording medium.** (ISO) The material on which *program instructions* and *text* are recorded; for example, a *diskette*.

**record key.** In *text processing*, a machine control that initiates the recording process.

**record layout.** The arrangement and structure of *data* or *words* in a *record*, together with a definition of the *order* and *size* of the component elements of the record.

**record length.** (ISO) Synonym for *record size*.

**record separator character (RS).** (ISO) The *information separator* used to identify a logical boundary between *records*.

**record size.** (ISO) The number of *characters* or *bytes* in a *record*. Synonymous with *record length*.

**record type.** In *database management systems*, the category to which a *record* belongs, by virtue of a *format* defined in the *database schema*.

**recovery.** (1) (ISO) A *process* in which a specified *data station* resolves conflicting or erroneous conditions arising during the *transfer* of *data*. (2) The resetting of *system resources* to a point at which *computer programs* can be restored without *error* in functional processing. (3) See *backward recovery*, *error recovery*, *forward recovery*.

**recovery and restart.** In a *database management system*, the procedures and capabilities available for reconstruction of the contents of a *database* to a state that prevailed before the detection of *processing errors* and before the occurrence of a *hardware* or *software failure* that resulted in the destruction of some or all of the *stored data*.

**recovery function.** (ISO) The capability of a *functional unit* to resume normal operations after a *failure*.

**recovery time.** (ISO) When sending or receiving *pulses*, the time required between the end of a pulse and the beginning of the next pulse. The term usually applies to equipment that sends or receives pulses.

**recursive function.** A *function* whose values are *natural numbers* that are derived from natural numbers by a substitution formula, in which earlier values of the function are *operands*.

**recursively-defined sequence.** A series of terms in which each term after the first is determined by an *operation* in which earlier values of the function are *operands*.

**recursive subroutine.** (ISO) A *subroutine* that may invoke itself. A recursive subroutine normally contains a *call* that invokes this subroutine directly or indirectly.

**reduction.** See *data reduction*.

**redundancy check.** (ISO) A check that uses one or more extra *binary digits* or *characters* attached to *data* for the detection of *errors*.

**redundancy-check character.** A *check character* derived from a *record* and appended to the record.

**reel.** (ISO) A cylinder with flanges on which tape or film may be wound.

**reenterable program.** (ISO) Synonym for *reentrant program*.

**reenterable routine.** (ISO) Synonym for *reentrant routine*.

**reenterable subroutine.** (ISO) Synonym for *reentrant subroutine*.

**reentrant program.** A *computer program* that may be entered before the completion of a prior execution of the same program, provided that neither *instructions* nor external *parameters* are modified during any execution. Synonymous with *reenterable program*.

**reentrant routine.** (ISO) A *routine* that may be entered before the completion of a prior execution of the same routine and execute correctly. Synonymous with *reenterable routine*.

**reentrant subroutine.** (ISO) A *subroutine* that may be entered before the completion of a prior execution of the same subroutine and execute correctly. Synonymous with *reenterable subroutine*.

**reentry point.** (ISO) The *address* or the *label* of the *instruction* at which a *computer program* that called a *subroutine* is reentered from the subroutine.

**reference.** In *programming languages*, an occurrence of an *identifier*. In *Ada*, this may be any occurrence; in *FORTRAN*, it may be any *read-only* occurrence; while in *PL/I*, it may be an occurrence anywhere, except in a *declaration*.

**reference code.** (ISO) In *text processing*, an *alphanumeric code* at the beginning of a recorded *document* that identifies or describes the document; for example, a title line.

**reference edge.** (1) (ISO) That edge of a *data medium* used to establish specifications or measurements in or on the data carrier. Synonymous with *guide edge*. (2) See *document reference edge*.

**reflected binary code.** Synonym for *gray code*.

**refresh.** (ISO) The process of repeatedly producing a *display image* on a *display surface* so that the image remains visible.



**refresh rate.** (ISO) The number of times per second at which a *display image* is produced for *refresh*.

**regeneration.** See *image regeneration*, *signal regeneration*.

**regenerative track.** The part of a *track* on a *magnetic drum* or *magnetic disk* that is used in conjunction with a *read head* and a *write head* that are connected to function as a *circulating storage*. Synonymous with *revolver track*.

**register.** (1) (ISO) A *storage device* that has a specified *storage capacity*. (2) See *address register*, *base address register*, *double-length register*, *double register*, *fixed-point register*, *flag register*, *floating-point register*, *general-purpose register*, *index register*, *instruction address register*, *instruction register*, *interrupt register*, *n-tuple length register*, *n-tuple register*, *quadruple-length register*, *quadruple register*, *shift register*, *triple-length register*, *triple register*.

**register length.** (ISO) The *storage capacity* of a *register*.

**registration.** The accurate positioning of an *entity* relative to a reference.

**relation.** In a *relational database*, a named *table* that identifies the set of occurrences of *entities* that have the same *attributes*.

**relational algebra.** In a *relational language*, a set of *operators*, such as *join* and *projection*, designed to manipulate entire *relations* as *operands*, to generate new *relations*.

**relational calculus.** In a *relational language*, a means of generating new *relations* or *subsets* of existing *relations* by specifying characteristics of the desired *tuples* or their *attributes*.

**relational language.** In a *relational database*, a *programming language*, usually with little computational capability, that may be used to *access*, *query*, or *modify* a *database* organized in accordance with a *relational model*.

**relational model.** (1) A *data model* whose pattern of organization is based on a set of *relations* defined in the form of *tables* whose rows of *data items* are ordered by the *attributes* of the associated *data elements*. (2) A *data model* that provides for the expression of *relationships* among *data elements* as formal mathematical relations.

**relationship.** A special type of *entity* that is used to indicate a *dependency*, an *association*, or a *link* that may be inherent between two *entities* or among *attributes* of the same *entity*, and that is represented or recorded in a *database*. Synonymous with *association*.

**relationship type.** A specified class of *relationships*, each of which is associated in the same way with a member of one class of *entities*. See also *attribute type*, *entity type*.

**relative address.** An *address* calculated as a displacement from a *base address*.

**relative addressing.** A method of *addressing* in which the *address part* of an *instruction* contains a *relative address*.

**relative coding.** Coding that uses *machine instructions* with *relative addresses*.

**relative command.** (ISO) In *computer graphics*, a *display command* that causes the *display device* to interpret the *data* following the command as *relative coordinates*. Synonymous with *relative instruction*.

**relative coordinate.** (ISO) One of the coordinates that identifies the position of an *addressable point* with respect to some other *addressable point*.

**relative error.** (ISO) The ratio of an *absolute error* to the true, specified, or theoretically correct value of the quantity that is in error.

**relative instruction.** (ISO) Synonym for *relative command*.

**reliability.** (ISO) The ability of a *functional unit* to perform a required *function* under stated conditions for a stated period of time.

**relief height.** The distance an *embossed character* is raised above the surface of a *plastic identification card*.

**relocatable address.** (ISO) An *address* that must be adjusted when the *computer program* that contains the address is *relocated*.

**relocatable program.** A *computer program* that is suitable for *dynamic relocation*.

**relocate.** (ISO) To move a *computer program* or part of the program in *main storage* and to make the necessary adjustment of *address references* so that the program can be executed after being moved.

**relocating loader.** A *loader* that adjusts *addresses*, relative to the *assembled origin*, by the *relocation factor*. See also *absolute loader*.

**relocation.** See *dynamic relocation*.

**relocation dictionary.** The part of an *object module* or *load module* that identifies all *addresses* that must be adjusted when a relocation occurs.

**relocation factor.** The algebraic difference between the *assembled origin* and the *loaded origin* of a *computer program*.

**remote access.** Pertaining to communication with a *data processing facility* through a *data link*.

**remote access data processing.** (ISO) *Data processing* in which some *input/output* functions are performed by devices that are connected to a *computer system* by means of *data communication*.

**remote batch entry.** (ISO) Submission of batches of *data* through an *input unit* that has access to a *computer* through a *data link*.

**remote batch processing.** (ISO) *Batch processing* in which *input/output units* have access to a *computer* through a *data link*.

**remote job entry (RJE).** (ISO) Submission of a *job* through an *input unit* that has access to a *computer* through a *data link*.

**remote station.** *Data terminal equipment* for communicating with a *data processing system* through a *data link*.

**reorganization.** (1) A major change in the way a *database* is logically or physically structured. Synonymous with *restructuring*. (2) In a *database management system*, the rearrangement of the contents of a *database* that becomes necessary when the total *storage space* allocated to the *database* becomes exhausted, or when utilization of *storage space* becomes degraded and wasteful as a result of ongoing *processing* activity in *database operations*. Synonymous with *restructuring*.

**repagination.** (1) In *text processing*, a renumbering of *pages* that results from a change in the contents of a *document*. (2) In *text processing*, a recalculation of the *page break points* that result from a change in the contents of a *document*.

**repair.** See *mean time to repair*.

**repeated selection sort.** A *selection sort* in which the *set of items* is divided into *subsets*; then one item, that fits specified criteria, from each subset is selected to form a second-level subset. A *selection sort* is then applied to the second-level subset; the selected item in this second level subset is appended to the sorted set and is replaced by the next eligible item in the original subset, and the *process* is repeated until all items are in the sorted set.

**repeater.** (ISO) In a *local area network*, a device that amplifies or regenerates *data signals* in order to extend the range of *transmission* between *data stations* or to interconnect two *branches*.

**repeating key.** (ISO) A *key* that continues to operate as long as it is held down.

**repertoire.** See *instruction repertoire*.

**repetition instruction.** An *instruction* that causes one or more *instructions* to be *executed* an indicated number of times.

**repetitive addressing.** A method of *implied addressing*, applicable only to *zero-address instructions*, in which the *operation part* of an *instruction* implicitly addresses the *operands* of the last *instruction executed*.

**repetitive operation.** (ISO) The *automatic repetition* of the solution of a *set of equations* with fixed combinations of initial conditions and other *parameters*. Repetitive operation is often used to permit the *display* of an apparently steady solution; it is also used to permit manual adjustment or optimization of one or more *parameters*.

**report program generator (RPG).** A commercially oriented *high-level programming language* used to generate business reports.

**representation.** See *analog representation*, *coded representation*, *digital representation*, *discrete representation*, *floating-point representation*, *incremental representation*, *linear representation*, *number representation*, *numeric representation*, *variable-point representation*.

**representation system.** See *fixed-point representation system*, *floating-point representation system*, *positional representation system*, *variable-point representation system*.

**reproducer.** (ISO) Synonym for *reproducing punch*.

**reproducing punch.** (ISO) A *punched card device* that prepares one *punched card* from another *punched card*, copying all or part of the *data* from the *punched card* that is *read*. Synonymous with *reproducer*.

**reprogrammable read-only memory.** (ISO) Synonym for *erasable programmable read-only memory*.

**required hyphen.** Synonym for *hard hyphen*.

**requirements.** (ISO) Essential conditions that *system development* has to meet.

**requirements analysis.** (ISO) A systematic investigation of *user requirements* to arrive at a definition of a *system*.

**rerun.** (ISO) A repeat of a *program run* from its beginning, usually made desirable or necessary by a false start, by an interruption, or by a change.

**rerun point.** That location, in a *sequence of instructions* in a *computer program*, at which all *information* pertinent to a *rerun* of the program is available.

**rerun time.** (ISO) That part of *operating time* that is used for *reruns* due to *faults* or *mistakes* in operations.

**rescue point.** Synonym for *restart point*.

**reserved word.** In *programming languages*, a *keyword* whose definition is fixed by the programming language and which cannot be changed by the *user*. In *Ada* and *COBOL* all keywords are reserved words.



**reset.** (1) (ISO) To cause a *counter* to take the state corresponding to a specified *initial number*. (2) (ISO) To put all or part of a *data processing device* back into a prescribed state.

**reset mode.** (ISO) Synonym for *initial condition mode*.

**resident.** (ISO) Pertaining to *computer programs* that remain on a particular *storage device*.

**resident control program.** (ISO) Synonym for *nucleus*.

**residual error ratio.** The *error ratio* that remains after attempts at correction are made.

**residue check.** (ISO) Synonym for *modulo-n check*.

**resolver.** (1) (ISO) A *functional unit* whose *input analog variables* are the polar coordinates of a point and whose *output analog variables* are the Cartesian coordinates of the same point, or vice-versa. (2) A device whose *input* is a *vector quantity* and whose *outputs* are components of the vector.

**resource.** Anything that a *system* or enterprise needs to perform required operations, including *main storage*, *input/output units*, one or more *processing units*, *files*, and *system programs*. See *data resource*, *information resource*.

**resource allocation.** (1) (ISO) The assignment of the facilities of a *computer system* for the accomplishment of *jobs*; for example, the assignment of *main storage*, *input/output units*, or *files*. (2) See *dynamic resource allocation*.

**response.** See *spectral response*.

**response duration.** The time duration between the start of a *pulse* that influences a *storage cell* and the end of the resulting response of that *storage cell*.

**response time.** (ISO) The elapsed time between the end of an inquiry or demand on a *computer system* and the beginning of the response; for example, the length of time between an indication of the end of an inquiry and the *display* of the first *character* of the response at a *user terminal*.

**restart.** (ISO) The resumption of the *execution* of a *computer program* using the *data* recorded at a *check-point*.

**restart point.** A point in a *computer program* at which its *execution* may be *restarted*; in particular, the *address* of a *restart instruction*. Synonymous with *rescue point*.

**restructuring.** Synonym for *reorganization*.

**retention cycle.** (ISO) The length of time specified for *data* on a *data medium* to be preserved. Synonymous with *retention period*.

**retention period.** (ISO) Synonym for *retention cycle*.

**retention period check.** (ISO) Synonym for *expiration check*.

**retrieval.** (1) In *information processing*, the act or process of recovering *data* or *information* from *storage*. (2) In a *conceptual schema language*, the making known of a *sentence* that has been *inserted* into the *information base* or *conceptual schema*, or that is deducible from other sentences in the *information base* or *conceptual schema*. (3) See *information retrieval*.

**retrieval code.** In *micrographics*, a code used for manual or automatic retrieval of *microimages*.

**retrieval command.** A *command* that initiates selection that may be followed by some action on the selected *data*.

**retrieval function.** In a *data manipulation language*, a capability to select and to locate *stored records* with specified characteristics and to transfer these records to a work area for any required further *processing* by an application *program*.

**retrieve.** To recover *data* or *information* from *storage*.

**return.** (1) In *programming languages*, within a *procedure*, a *language construct* that designates a *statement* that ends the *execution* of the *procedure*. (2) See *carriage return*.

**return code.** A code that is used to influence the *execution* of succeeding *instructions*.

**return-to-reference recording.** (ISO) *Magnetic recording* such that the patterns of magnetization used to represent zeros and ones occupy only part of the *storage cell*, and the remainder of the cell is magnetized to a reference condition.

**return-to-zero recording.** (ISO) *Return-to-reference recording* in which the reference condition is the absence of magnetization.

**reusable program.** A *computer program* that may be loaded once and executed repeatedly, subject to the requirements that any *instructions* that are modified during its execution are returned to their initial states and that its *external program parameters* are preserved unchanged.

**reverse clipping.** (ISO) Synonym for *shielding*.

**reverse direction flow.** In *flowcharting*, a flow in a direction other than left to right or top to bottom.

**reverse indexing.** (ISO) In *text processing*, a feature that causes the *typing position* or the *display pointer* to be moved to the corresponding *character position* of the preceding *typing line* or *display line*.

**reverse Polish notation.** (ISO) Synonym for *postfix notation*.

**reverse printer.** Synonym for *bidirectional printer*.



**reverse search.** (ISO) In *text processing*, an *automatic search* from any position in a *document* toward the beginning of the document.

**reversible counter.** (ISO) A *functional unit* with a finite number of states each of which represents a *number* that can be, upon receipt of an appropriate *signal*, increased or decreased by unity or by a given constant. The device is usually capable of bringing the represented number to a specified value; for example, zero.

**revision number.** In an *information resource dictionary*, a nonnegative *integer* that is a component of the *version identifier* of the *access name* of an *entity* and that is assigned consecutively to each change that affects the entity.

**revolver track.** Synonym for *regenerative track*.

**rewind.** (ISO) To bring a *magnetic tape* or *paper tape* to its initial *data point*.

**rewind control.** (ISO) In *text processing*, a control that causes *magnetic tape* to be rewound to the start position, normally at high speed.

**right-adjust.** To control the *display* or *printing position* of *characters* on a *page* so that the right-hand margin but not the left-hand margin of the printing or display is regular. Synonymous with *right-align*. Contrast with *left-adjust*.

**right-align.** Synonym for *right-adjust*.

**right-justify.** (1) To *shift* the contents of a *register* or a *field* so that the significant *character* at the right-hand end of the *data* is at a particular position. (2) In *text processing*, deprecated term for *right-adjust*.

**ring latency.** (ISO) In a *token ring network*, the time, measured in *bits* at the *data transmission rate*, required for a *signal* to propagate once around the ring. Ring latency includes the signal propagation delay through the ring medium, including drop cables, plus the sum of propagation delays through each *data station* connected to the token ring network.

**ring network.** (1) (ISO) A *network* in which every *node* has exactly two *branches* connected to it. (2) See Figure 17.

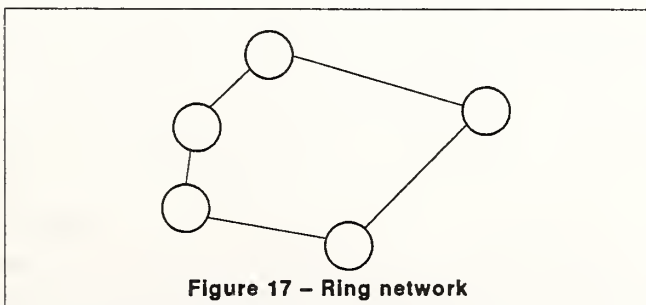


Figure 17 – Ring network

**rise time.** (ISO) In the approximation of a step function, the time required for a *signal* to change from a

specified low value to a specified high value. Usually these values are 10 percent and 90 percent of the step height.

**RJE.** *Remote job entry*.

**robot.** A *functional unit* that may be *programmed* to manipulate or move under automatic control.

**robotics.** The field of knowledge concerned with the design and implementation of *robots* for particular applications.

**rollback.** (1) The restoration of a *database* to its state at a prior, specified point in time. (2) A programmed return to a prior *checkpoint*.

**roll in.** (ISO) To restore to *main storage* the sets of *data* that were previously *rolled out*.

**rolling.** (ISO) *Scrolling* restricted to an upward or downward direction.

**roll out.** (ISO) To transfer sets of *data*, such as *files* or *computer programs* of various sizes, from *main storage* to *auxiliary storage* for the purpose of freeing main storage for another use.

**ROM.** (1) (ISO) A *memory* in which *data*, under normal conditions, can only be *read*. (2) See *programmable read-only memory*, *reprogrammable read-only memory*. (3) Synonymous with *read-only memory*.

**root.** The highest *level* of a hierarchy.

**root record.** In a *hierarchical database*, the *record* located at the highest *level*. Synonymous with *base node*.

**root segment.** In an *overlay operation*, the part of a *program* that must remain in *main storage* when other *overlay segments* are executed. It is the first segment of an *overlay program*. Synonymous with *control segment*.

**rotation.** (ISO) Turning *display elements* about an axis.

**rotational delay.** (ISO) Synonym for *search time*.

**rotational position sensing.** (ISO) A technique used to locate a given *sector*, a desired *track*, and a specific *record* by continuous comparison of the *read/write head* position with appropriate *synchronization signals*.

**round.** (ISO) To *delete* or omit one or more of the least *significant digits* in positional representation and to adjust the part retained in accordance with some specified rule. The purpose of rounding is usually to limit the *precision* of the *numeral* or to reduce the number of *characters* in the numeral, or to do both.

**round down.** (ISO) To *round*, by making no adjustment to the part of the *numeral* that is retained. If a numeral is rounded down, its absolute value is not increased.

Rounding down is a form of truncation; for example, the numerals 12.6374 and 15.0625, when rounded down to two decimal places, become 12.63 and 15.06 respectively.

**rounding error.** (ISO) An error due to *rounding*.

**round off.** (1) (ISO) To *round*, adjusting the part of the *numeral* retained by adding 1 to the least significant of its *digits* and executing any necessary carries, if and only if the most significant of the digits deleted was equal to or greater than half the *radix* of its *digit place*; for example, the numerals 12.6375 and 15.0625, when rounded off to two *decimal* places, become 12.64 and 15.06 respectively. (2) (ISO) To *round*, adjusting the part of the *numeral* retained by adding one to the least significant of its *digits* and *executing* any necessary carries, if: (a) the most significant of the digits deleted was greater than half the *radix* of that *digit place*; (b) the most significant of the digits deleted was equal to half the *radix* and one or more of the following digits were greater than zero; or (c) the most significant of the digits deleted was equal to half the *radix*, all the following digits were equal to zero, and the least significant of the digits retained was odd; for example, the numerals 12.6375 and 15.0625, when rounded off to three *decimal* places, become 12.638 and 15.062 respectively. In this definition, even may be substituted for odd.

**round-trip propagation time.** (ISO) In a *bus network*, twice the time required for a *bit* to travel between the two most distant *data stations*. Round-trip propagation time is used to determine the minimum size of *transmission frames* used in a network.

**round up.** (ISO) To *round*, adjusting the part of the *numeral* that is retained by adding 1 to the least significant of its *digits* and *executing* any necessary carries, if and only if one or more non-zero digits have been deleted. If a numeral is rounded up, its absolute value

is not decreased; for example, the numerals 12.6374 and 15.0625, when rounded up to two *decimal* places, become 12.64 and 15.07, respectively.

**routine.** (1) (ISO) A *program*, called by another program, that may have some general or frequent use. (2) See *library routine*, *output routine*, *reentrant routine*, *utility routine*.

**row.** (1) A horizontal arrangement of *characters* or other expressions. (2) See *card row*, *mark-sensing row*.

**row binary.** Pertaining to the *binary* representation of *data* on cards in which the significances of punch positions are assigned along card rows; for example, each row in an 80-column card may be used to represent 80 consecutive *binary digits*.

**row pitch.** (ISO) The distance between corresponding points of adjacent rows measured along a *track*.

**RPG.** Report program generator.

**RS.** The record separator character.

**rubber-banding.** (ISO) In *computer graphics*, moving the common ends of a set of straight lines while the other ends remain fixed.

**run.** (1) (ISO) A performance of one or more *jobs*. (2) (ISO) A performance of one or more *programs*. (3) See *job run*, *program run*.

**run time.** (ISO) Synonym for *execution time*.

**run stream.** (ISO) Synonym for *job stream*.

**run unit.** An execution of one or more *programs* as a unit.

**RZ.** Return-to-zero recording.

**RZ (NP).** Non-polarized return-to-zero recording.

**RZ (P).** Polarized return-to-zero recording.



## S

**safety ring.** (ISO) Synonym for *file-protection ring*.

**sample.** (ISO) To obtain the values of a *function* for regularly or irregularly spaced distinct values from its domain. Other meanings of this term may be used in particular fields; for example, in statistics.

**sample-and-hold device.** (ISO) A device that senses and stores the instantaneous value of an *analog signal*.

**sampling.** (1) Obtaining the values of a *function* for regularly or irregularly spaced distinct values of an independent *variable*. (2) In statistics, obtaining a sample from a population.

**save.** (ISO) In *text processing*, a *function* or mode that enables a *user* to write into a *file* previously entered or modified *text*.

**save area.** An area of *main storage* in which the contents of *registers* are saved.

**scalar.** (1) (ISO) A quantity characterized by a single value. (2) Contrast with *vector*.

**scale.** (1) (ISO) To change the representation of a quantity, by expressing it in other units, so that its range is brought within a specified range. (2) To adjust the representation of a quantity by a factor in order to bring its range within prescribed limits.

**scale factor.** (1) (ISO) A *number* used as a multiplier in *scaling*, for example, a scale factor of .001 would be suitable to *scale* the values 856, 432, -95, and -182 to lie within the range -1 to +1 inclusive. Synonymous with *scaling factor*. (2) See *time scale factor*.

**scaling.** (ISO) In *computer graphics*, enlarging or diminishing all or part of a *display image*. Scaling does not require the same factor in all directions.

**scaling factor.** (ISO) Synonym for *scale factor*.

**scan.** (1) (ISO) To examine every reference or every entry in a *file* routinely as part of a *retrieval* scheme. (2) To examine *sequentially*, part by part. (3) See *directed-beam scan*, *flying spot scan*, *raster scan*.

**scanner.** (1) (ISO) A device that examines a spatial pattern, one part after another, and generates *analog* or *digital signals* corresponding to the pattern. Scanners are often used in *mark sensing*, *pattern recognition*, or *character recognition*. (2) See *flying spot scanner*, *optical scanner*.

**scanning.** (ISO) The systematic examination of *data*.

**schedule.** (ISO) To select *jobs* or *tasks* that are to be dispatched. In some *operating systems*, other units of work such as *input/output operations* may also be scheduled.

**scheduled maintenance.** (ISO) *Maintenance* carried out in accordance with an established time schedule.

**scheduler.** A *computer program* designed to perform *functions* such as *scheduling*, initiating, and terminating *jobs*.

**schema.** (1) A description, or global model, of the structure of a *database*. (2) See *conceptual schema*, *database schema*, *external schema*, *information resource dictionary schema*, *internal schema*, *logical schema*, *physical schema*, *storage schema*. (3) See also *subschema*.

**scored card.** A special card that contains one or more scored lines to facilitate precise folding or separation of certain parts of the card.

**screen editor.** (ISO) In *text processing*, a *text editor* that *displays text* and associated editing *information* on a display screen and allows editing of *character strings* indicated by positioning the *cursor* without regard for line numbers.

**scratch-pad memory.** A *read/write storage device* or *register* that may be used for the temporary storage of intermediate *data* or *pointers*.

**scroll.** In *text processing*, a technique in which the *text* is moved up, down, or horizontally in order to *display* more text than can be shown at one time on a display screen.

**scrolling.** Moving a *display image* vertically or horizontally in order to view *data* not otherwise visible within the boundaries of a display screen or *window*.

**search.** (1) (ISO) The examination of one or more *data elements* of a *set* for one or more elements that have a given property. (2) To examine a *set* of *items* for one or more having a given property. (3) See *binary search*, *chaining search*, *dichotomizing search*, *fibonacci search*.

**search cycle.** That part of a *search* that is repeated for each *item*, normally consisting of locating the item and carrying out a *comparison*.

**search key.** (1) (ISO) A *key* used for *data retrieval*. (2) In a *record*, a *data item* that represents one of the *data values* of the range allowed for a particular *attribute* of an *entity*.

**search time.** The time interval required for the *read/write head* of a *direct access storage device* to locate a particular *record* on a *track* corresponding to a given *address* or *key*. Synonymous with *rotational delay*.

**secondary key.** A *key* that is not a *primary key*, but for which an *index* is maintained and that may identify more than one *record*.

**secondary station.** (ISO) In high-level data link control, the part of a *data station* that executes control



*functions* as instructed by the *primary station* and that interprets received *commands* and generates responses for *transmission*.

**section.** (ISO) Deprecated term for *segment*.

**sector.** (ISO) A predetermined angular part of a *track* or a *band* on a *magnetic drum* or *magnetic disk* that can be *addressed*.

**security.** See *data security*, *data processing system security*.

**security feature.** (ISO) In *credit card processing*, a visible or invisible feature of an *identification card*; it provides a means of *authentication* of a *user* and helps to deter counterfeiting.

**seek.** To selectively position the *access mechanism* of a *direct access device*.

**seek time.** (1) (ISO) The time required for the *access arm* of a *direct access storage device* to be positioned on the appropriate *track*. Synonymous with *positioning time*. (2) See Figure 1.

**segment.** (1) A portion of a *program* that may be executed without the entire program being maintained in *main storage*. (2) To divide a *computer program* into *segments*. (3) See *control segment*, *display segment*, *root segment*.

**selecting.** (ISO) On a *multipoint connection*, or a *point-to-point connection*, the process of requesting one or more *data stations* to receive *data*.

**selection check.** A *check* that verifies the choice of devices, such as *registers*, in the execution of an *instruction*.

**selection signal.** (ISO) In a *switched network*, the sequence of *characters* that indicates all the *information* required to establish a *call*.

**selection sort.** (1) A *sort* in which the *items* in a set are examined to find an item that fits specified criteria; this item is appended to the sorted set and removed from further consideration, and the process is repeated until all items are in the sorted set. (2) See *repeated selection sort*.

**selective dump.** (ISO) The *dumping* of the contents of one or more specified *storage areas*. See also *change dump*.

**self-adapting computer.** A *computer* that can change its performance characteristics in response to its environment.

**self-adapting program.** A *computer program* that can change its performance characteristics in response to its environment.

**self-checking code.** (ISO) Synonym for *error-detecting code*.

**self-contained.** (1) Pertaining to the capability of being used on a standalone basis. (2) Pertaining to a *database management system* that has a complete *programming language* that has all the necessary facilities for control and processing of a *database*.

**self-contained system.** A *database management system* whose capabilities and *language* are intended primarily for the nonprogrammer.

**semantics.** (1) (ISO) The relationships of *characters* or groups of *characters* to their meanings, independent of the manner of their interpretation and use. (2) The relationships between *symbols* and their meanings. (3) See also *pragmatics*, *syntax*.

**sensing.** See *mark sensing*.

**sensing station.** (ISO) Synonym for *read station*.

**sentence.** (1) (ISO) In *text processing*, a sequence of *words* that is terminated by an end punctuation mark. (2) In a *conceptual schema language*, a *linguistic object* that expresses a *proposition*.

**sentence control.** (ISO) In *text processing*, a control used to process text one sentence at a time; for example, *skip*, *delete*, *move*, *print*.

**sentinel.** Synonym for *flag*.

**separate compilation.** (ISO) The compilation of a *compilation unit* using all the necessary interface and context information from related compilation units. Interface and context information is used by the compiler to check validity and to resolve references. Synonymous with *dependent compilation*.

**separating character.** (ISO) Synonym for *information separator*.

**separator.** (1) (ISO) Synonym for *delimiter*. (2) See *information separator*.

**separator character.** See *file separator character*, *group separator character*, *record separator character*.

**septet.** (ISO) A *byte* composed of seven *binary elements*. Synonymous with *seven-bit byte*.

**sequence.** (1) (ISO) A series of *items* that have been sequenced. (2) An arrangement of *items* according to a specified set of rules; for example, items arranged alphabetically, numerically, or chronologically. (3) (ISO) To place *items* in an arrangement in accordance with the order of the *natural numbers*. (4) Deprecated term for *order*. (5) See *calling sequence*, *collating sequence*, *pseudo-random number sequence*, *random number sequence*, *recursively-defined sequence*.

**sequence-by-merging.** To sequence by repeated splitting and merging.

**sequence check.** (ISO) A check to determine whether *items* follow one another in a prescribed manner.

**sequence control register.** (ISO) Deprecated term for *instruction address register*.

**sequencing key.** Synonym for *sort key*.

**sequential.** (1) (ISO) Pertaining to a *process* in which all events occur one after the other, without any time lapse between them. (2) Contrast with *consecutive*. (3) See also *concurrent*, *simultaneous*.

**sequential access.** (1) (ISO) The capability to enter *data* into a *storage device* or a *data medium* in the same *sequence* as the *data* are *ordered*, or to obtain *data* in the same *order* as they were entered. (2) Synonymous with *serial access*.

**sequential access storage.** (ISO) A *storage device* that provides only *sequential access* to *data*. Synonymous with *serial access storage*.

**sequential batch processing.** A mode of operating a *computer* in which a *run* must be completed before another *run* can be started.

**sequential circuit.** (ISO) A logic device whose *output* values, at a given instant, depend upon its *input* values and internal state at that instant, and whose internal state depends upon the immediately preceding input values and the preceding internal state. A sequential circuit can assume a finite number of internal states and may therefore be regarded, from an abstract point of view, as a finite automaton.

**sequential computer.** A *computer* in which events occur in time *sequence*, with little or no simultaneity or overlap of events.

**sequential file.** A *file* in which *records* are *ordered* according to the values of one or more *key fields*, and processed in the same *sequence* from the beginning of the *file*.

**sequential logic element.** A device that has at least one *output channel* and one or more *input channels*, all characterized by discrete states, such that the state of each output channel is determined by the previous states of the input channels.

**sequential operation.** (ISO) A mode of operation in which two or more *operations* are performed one after another. Synonymous with *consecutive operation*.

**serial.** (1) (ISO) Pertaining to a *process* in which all events occur one after the other; for example, the *serial transmission* of the *bits* of a *character* according to the CCITT V25 protocol. (2) Pertaining to the *sequential* or *consecutive* occurrence of two or more related activities in a single device or *channel*. (3) Pertaining to the *sequential processing* of the individual parts of a whole, such as the *bits* of a *character* or the characters of a *word*, using the same facilities for successive parts. (4) Contrast with *parallel*.

**serial access.** Synonym for *sequential access*.

**serial access storage.** (ISO) Synonym for *sequential access storage*.

**serial adder.** (1) (ISO) An *adder* in which addition is performed by adding, *digit place* after *digit place*, the corresponding *digits* of the *operands*. (2) Contrast with *parallel adder*.

**serial addition.** (ISO) Addition that is performed by adding, *digit place* after *digit place*, the corresponding *digits* of the *operands*.

**serial computer.** (1) A *computer* that has a single *arithmetic and logic unit*. (2) A *computer*, some specified characteristic of which is *serial*; for example, a computer that manipulates all *bits* of a *word* serially. (3) Contrast with *parallel computer*.

**serial file.** A *file* in which *records* are *ordered* in *sequence* according to the values of one or more *key fields* in each record.

**serializer.** (ISO) A *functional unit* that converts a set of *simultaneous signals* into a corresponding time *sequence* of signals. Synonymous with *dynamicizer*, *parallel-serial converter*.

**serial number.** (ISO) An *integer* that denotes the position of an *item* in a *sequence*.

**serial operation.** (1) Pertaining to the *sequential* or *consecutive execution* of two or more *operations* in a single device such as an *arithmetic and logic unit*. (2) (ISO) Deprecated term for *sequential operation*. (3) Contrast with *parallel operation*.

**serial-parallel converter.** (ISO) Synonym for *staticizer*.

**serial printer.** (ISO) Synonym for *character printer*.

**serial processing.** (1) Pertaining to the *sequential* or *consecutive execution* of two or more *processes* in a single device such as a *channel* or *processing unit*. (2) Contrast with *parallel processing*.

**serial sort.** A *sort* that requires only *sequential access* to the *items* in a *set*.

**serial transmission.** (1) (ISO) The *sequential transmission* of the *signal* elements of a group representing a *character* or other *entity* of *data*. (2) Contrast with *parallel transmission*.

**server.** (ISO) In a *network*, a *data station* that provides facilities to other stations; for example, a file server, a print server, a mail server.

**service.** (ISO) In *network architecture*, the capabilities that a layer and the layers closer to the physical media provide to the layers closer to the *end user*.

**service program.** (ISO) Synonym for *utility program*.

**service routine.** (ISO) Synonym for *utility routine*.



**servomechanism.** (1) An *automatic* device that uses feedback to govern the physical position of an element. (2) A feedback control system in which at least one of the system *signals* represents mechanical motion.

**session.** (1) (ISO) In *network architecture*, an association of those facilities necessary for establishing, maintaining, and releasing connections for communication between *data stations*. (2) The period of use for interaction with a *system*, from *logon* to *logoff*.

**set.** (1) (ISO) A finite or infinite number of objects, *entities*, or concepts, that have a given property or properties in common. (2) (ISO) To cause a *counter* to take the state corresponding to a specified *number*. (3) (ISO) To put all or part of a *data processing* device into a specified state. (4) In the *CODASYL model*, a set of *records* that represents a hierarchical relationship between its owner record and the member records of the set. (5) See *alphabetic character set*, *alphanumeric character set*, *character set*, *coded character set*, *code set*, *entity set*, *instruction set*, *machine instruction set*, *numeric character set*, *numeric coded character set*, *universal set*.

**set occurrence.** In the *CODASYL model*, an occurrence of an owner *record* together with zero or more occurrences of its member records.

**settling time.** (ISO) Following the initiation of a specified *input signal* to a *system*, the time required for the *output signal* to enter and remain within a specified narrow range centered on its steady-state value. The input may be a step, impulse, ramp, parabola, or sinusoid; for a step or impulse, the range is often specified as plus or minus two per cent of the final steady-state value.

**set type.** In the *CODASYL model*, a specification of an association between two *record types*.

**seven-bit byte.** (ISO) Synonym for *septet*.

**sexadecimal.** Synonym for *hexadecimal*.

**sextet.** (ISO) A *byte* composed of six *binary elements*. Synonymous with six-bit byte.

**shared logic text processing equipment.** (ISO) *Word processing* equipment in which the *resources* of a *processing unit* and *storage devices* are shared between two or more *workstations*.

**Sheffer stroke.** Synonym for *NAND*.

**shielding.** (ISO) Suppression of all the *display elements* that lie within a given boundary. Synonymous with reverse clipping.

**shift.** (1) (ISO) The movement of some or all of the *characters* of a *word* each by the same number of character positions in the direction of a specified end

of the word. (2) See *arithmetic shift*, *end-around shift*, *logical shift*.

**shift-in character (SI).** (ISO) A *code extension character* that is used to terminate a *sequence* that has been introduced by the *shift-out character*, that makes effective the *graphic characters* of the standard *character set*.

**shift-out character (SO).** (ISO) A *code extension character* that substitutes for the *graphic characters* of the standard *character set* an alternative set of characters upon which agreement has been reached or that has been designated by the use of code extension procedures.

**shift register.** (ISO) A *register* in which *shifts* are performed.

**SI.** The *shift-in character*.

**side effect.** In *programming languages*, any external effect, in a *function procedure*, other than that of yielding the result value, that is caused by the execution of the procedure.

**sifting sort.** Synonym for *bubble sort*.

**sight check.** A *check* performed by sighting through the holes of two or more aligned *punched cards* toward a source of light to verify the punching; for example, to determine if a hole has been punched in a corresponding *punch position* on all cards in a *card deck*.

**sigma memory.** (ISO) *Storage* in a *calculator* that is used to accumulate the results of a series of calculations.

**signal.** (1) (ISO) A variation of a physical quantity, used to convey *data*. (2) A time-dependent value attached to a physical phenomenon and conveying *data*. (3) See *call-accepted signal*, *call-not accepted signal*, *contact interrogation signal*, *enabling signal*, *inhibiting signal*, *start signal*, *stop signal*.

**signal distance.** The number of *digit positions* in which the corresponding *digits* of two *binary words* of the same length are different. Synonymous with *hamming distance*.

**signal regeneration.** (ISO) *Signal transformation* that restores a *signal* so that it conforms to its original characteristics.

**signal shaping.** (ISO) Synonym for *signal transformation*.

**signal transformation.** (ISO) The modification of one or more characteristics of a *signal*, such as its maximum value, shape, or timing. Synonymous with *signal shaping*.

**sign bit.** (ISO) A *bit* or a *binary element* that occupies a *sign position* and indicates the algebraic sign of the



*number* represented by the *numeral* with which it is associated.

**sign change function.** (ISO) In a *calculator*, the *function* that reverses the sign of a *number*.

**sign character.** (ISO) A *character* that occupies a *sign position* and indicates the algebraic sign of the *number* represented by the *numeral* with which it is associated.

**significance.** (ISO) Synonym for *weight*.

**significant digit.** (ISO) In a *numeral*, a *digit* that is needed for a given purpose; in particular, a digit that must be kept to preserve a given *accuracy* or a given *precision*.

**significant digit arithmetic.** (ISO) A method of making calculations by the use of a modified form of a *floating-point representation system* in which the number of *significant digits* in the result is determined with reference to the number of significant digits in the *operands*, the *operation* performed, and the degree of *precision* available.

**significant figure.** (ISO) Deprecated term for *significant digit*.

**sign position.** (ISO) A position, normally located at one end of a *numeral*, that contains an indicator denoting the algebraic sign of the *number* represented by the numeral.

**simple buffering.** (ISO) A technique for assigning *buffer storage* for the duration of the *execution* of a *computer program*.

**simplex transmission.** (ISO) *Data transmission* in one preassigned direction only.

**simulate.** (1) To represent certain features of the behavior of a physical or abstract *system* by the behavior of another system; for example, to represent a physical phenomenon by means of *operations* performed by a *computer* or to represent the operations of a computer by those of another computer. (2) To imitate one *system* with another, primarily by *software*, so that the imitating system accepts the same *data*, *executes* the same *computer programs*, and achieves the same results as the imitated system. (3) Contrast with *emulate*.

**simulation.** (1) (ISO) The representation of selected characteristics of the behavior of one physical or abstract *system* by another system; for example, the representation of physical phenomena by means of operations performed by a *data processing system*; or the representation of operations of a data processing system by those of another data processing system. (2) See *real-time simulation*. (3) Contrast with *emulation*.

**simulator.** A device, *data processing system*, or *computer program* that represents certain features of the behavior of a physical or abstract system. (2) See *computer simulator*.

**simultaneous.** (1) (ISO) In a *process*, pertaining to two or more events that occur within the same interval of time, each one handled by a separate *functional unit*; for example, in the *execution* of one or more *programs*, several *input/output* operations handled by *input/output channels*, *input/output controllers*, and associated *peripherals* may be simultaneous with one another, and with other operations handled directly by the *processing unit*. (2) Contrast with *concurrent*. (3) See also *consecutive*, *sequential*.

**simultaneous computer.** (ISO) A *computer* that contains a separate unit to perform each portion of the entire computation concurrently, the units being interconnected in a way determined by the computation; at different times in a *run*, a given interconnection carries *signals* representing different values of the same *variable*; for example, a *differential analyzer*.

**single precision.** (ISO) Characterized by the use of one *computer word* to represent a *number* in accordance with the required *precision*.

**single step.** Pertaining to a method of operating a *computer* in which each step is performed in response to a single manual *operation*.

**single-step operation.** (ISO) A mode of operation of a *computer* in which a single *computer instruction* or part of the instruction is *executed* in response to an external *signal*. Synonymous with *step-by-step operation*.

**sink.** See *data sink*, *message sink*.

**six-bit byte.** (ISO) Synonym for *sextet*.

**skeletal code.** A set of *instructions* in which some parts, such as *addresses*, must be completed or specified in detail each time the set is used.

**skew.** (ISO) The angular or longitudinal deviation of a *tape row* from a specified reference.

**skip.** (1) (ISO) In *text processing*, a *function* that allows recorded *text*, such as a *page* or *paragraph*, to be bypassed. (2) To ignore one or more *instructions* in a sequence of instructions. (3) To pass over one or more positions on a *data medium*, for example, to perform one or more *line feed* operations. (4) See *paper skip*.

**slave station.** (ISO) In *basic mode link control*, the *data station* that is selected by a *master station* to receive *data*.

**slotted-ring network.** (ISO) A *ring network* that allows unidirectional *data transmission* between *data stations* by transferring *data* in predefined slots in the trans-

mission stream over one *transmission medium* such that the data returns to the originating station.

**slot time.** (ISO) In *carrier sense multiple access network with collision detection*, a protocol that requires carrier sense and in which a transmitting data station that detects another signal while transmitting stops sending, sends a *jam signal*, and then waits for a variable length of time before trying again.

**slow time scale.** Synonym for *extended time scale*.

**smooth.** To apply procedures that decrease or eliminate rapid fluctuations in *data*.

**snapshot dump.** (1) A dynamic *dump* of the contents of one or more specified *storage areas*. (2) A selective *dump* performed at various points in a machine run.

**snapshot program.** (ISO) A *trace program* that produces *output data* only for selected *instructions* or for selected conditions.

**SO.** The *shift-out character*.

**soft copy.** (ISO) A nonpermanent *display image*; for example, a cathode ray tube display.

**soft error.** (ISO) An *error* that occurs sporadically and that may not appear on successive attempts to *read information* correctly.

**soft hyphen.** (ISO) A *special character*, inserted automatically or by the *user* in a word to mark where the word can be divided, and *displayed* as a hyphen when the word must be divided at the end of the *line* due to lack of space. Soft hyphens are subject to *hyphen drop*. Synonymous with *discretionary hyphen*, *syllable hyphen*. Contrast with *hard hyphen*.

**soft sectoring.** (1) (ISO) The identification of *sector boundaries* on a *magnetic disk* by using recorded *information*. (2) Contrast with *hard sectoring*.

**software.** (1) *Programs*, procedures, rules, and any associated *documentation* pertaining to the *operation* of a *system*. (2) Contrast with *hardware*.

**SOH.** The *start-of-heading character*.

**solid state component.** A component whose operation depends on the control of electric or magnetic phenomena in solids; for example, a transistor or crystal diode.

**sonic delay line.** Synonym for *acoustic delay line*.

**sort.** (1) (ISO) To segregate *items* into groups according to specified criteria without necessarily ordering the items within each group. (2) To arrange a set of *items* according to *keys* which are used as the basis for determining the *sequence* of the items; for example, to arrange the records of a personnel file into alphabetic sequence by using employee names as *sort keys*. (3) See *balanced merge sort*, *bubble sort*,

*exchange sort*, *external sort*, *internal sort*, *merge sort*, *multipass sort*, *oscillating sort*, *polyphase sort*, *repeated selection sort*, *selection sort*, *serial sort*, *tournament sort*, *unbalanced merge sort*.

**sorter.** (1) (ISO) A device that deposits *punched cards* into pockets selected according to the *hole patterns* in the cards. (2) A person, device, or computer routine that sorts.

**sort key.** A key used as the basis for determining the *sequence of items* in a set. Synonymous with *sequencing key*.

**sort pass.** The phase of a *sort-merge program* that consists of reading a set of *unsorted data items*, ordering them, and placing the ordered set as a *string* on a *data medium*. This process is repeated until all *input data* are placed in some string. The *merge* phase is then begun to merge the strings into a single ordered set.

**sort program.** A computer program that sorts *items* of *data*.

**source.** See *data source*, *message source*.

**source data card.** A card that contains manually or mechanically recorded *data* that are to be subsequently *punched* into the same card.

**source language.** A *language* from which *statements* are *translated*.

**source program.** (1) (ISO) A computer program that is expressed in a *source language*. (2) See also *object program*.

**SP.** The *space character*.

**space.** (1) A basic unit of area, usually the size of a single *character*. (2) One or more *space characters*. (3) To advance the reading or *display* position according to a prescribed format; for example, to advance the printing or display position horizontally to the right or vertically downward. (4) Contrast with *backspace*. (5) See *address space*, *display space*, *work space*, *working space*.

**space character (SP).** (ISO) A *character* that causes the print or *display* position to advance one position along the line without producing any *graphic character*.

**span.** (1) (ISO) The difference between the highest and the lowest values that a quantity or *function* may take. Synonymous with *range*. (2) See *error span*.

**special character.** (ISO) A *graphic character* that is not a *letter*, *digit*, or *blank character* and usually not an ideogram; for example, a punctuation mark, a general currency symbol, a percentage sign, a mathematical symbol.



**special purpose computer.** A computer that is designed to operate upon a restricted class of problems.

**specific address.** Synonym for *absolute address* (1).

**specific coding.** Synonym for *absolute coding*.

**spectral response.** The variation in sensitivity of a device to light of different wavelengths.

**splitter.** (ISO) In a *local area network*, a passive device used at a *node* to interconnect more than two *branches*. A splitter neither amplifies nor regenerates *data signals*.

**splitting.** (ISO) The partitioning of *storage* into independent sections.

**spool.** See *tape spool*.

**spooling.** (ISO) The use of *auxiliary storage* as *buffer storage* to reduce *processing delays* when transferring *data* between peripheral equipment and the *processors* of a *computer*. The term is derived from the expression Simultaneous Peripheral Operation On Line.

**spot punch.** (ISO) A device for punching one hole at a time in a *data medium*.

**spreadsheet.** A worksheet arranged in *rows* and *columns*, in which a change in the contents of one cell can cause electronic recomputation of one or more cells, based on *user-defined relations* among the cells.

**sprocket hole.** (ISO) Synonym for *feed hole*.

**sprocket track.** (ISO) Synonym for *feed track*.

**square function.** (ISO) The *function* that multiplies a *number* by itself directly.

**square root function.** (ISO) The *function* that directly provides a *number* that, when multiplied by itself, produces the original number.

**stability.** See *computational stability*, *light stability*.

**stable state.** In a *trigger circuit*, a state in which the circuit remains until the application of a suitable *pulse*.

**stack.** (ISO) Synonym for *pushdown list*.

**stacker.** See *card stacker*.

**stack indicator.** (ISO) Synonym for *stack pointer*.

**stack pointer.** (ISO) The *address* of the *main storage location* that contains the *data item* most recently stored in *pushdown storage*. Synonymous with *stack indicator*.

**stack storage.** (ISO) Synonym for *pushdown storage*.

**staging drive.** A *direct access storage device* that is designated to receive *data* from a *mass storage facility*.

**standard form.** (ISO) Synonym for *normalized form*.

**standing-on-nines carry.** (ISO) In *parallel addition of numbers* represented by *decimal numerals*, a procedure in which a *carry* to a given *digit place* is bypassed to the next *digit place* if the current sum in the given *digit place* is 9, and the 9 is changed to 0.

**star network.** (1) A radial, or starlike, configuration of *nodes* connected to a central node, in which each node exchanges *data* directly with the central node. (2) See Figure 18.

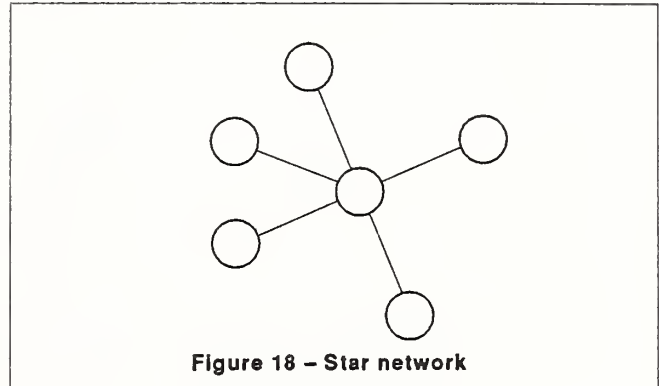


Figure 18 - Star network

**star/ring network.** (1) (ISO) A *ring network* with *unidirectional transmission*, laid out in such a way that several *data stations* are grouped and interconnected to the network by means of *lobe attaching units*. This configuration allows attachment and removal of *data stations* without disrupting network operations. (2) See Figure 19.

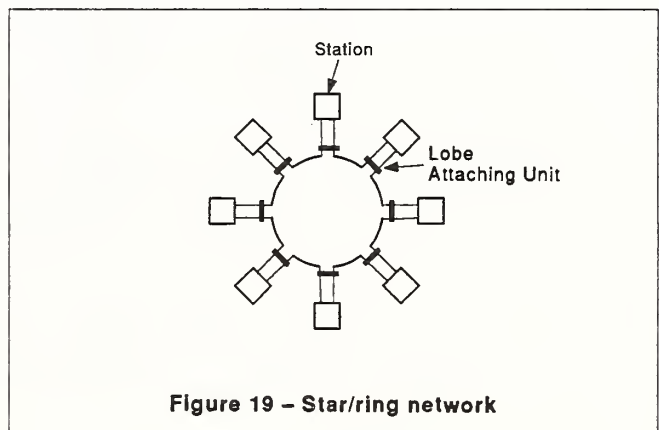


Figure 19 - Star/ring network

**starting frame delimiter.** (ISO) A specified *bit pattern* that indicates the start of a *transmission frame*.

**start-of-heading character (SOH).** (ISO) A *transmission control character* that is used as the first *character* of a *message heading*.

**start-of-text character (STX).** (ISO) A *transmission control character* that precedes a *text* and that may be used to terminate the *message heading*.

**start signal.** (1) (ISO) In *start-stop transmission*, a *signal* at the beginning of a *character* that prepares the receiving device for the reception of the *code elements*. A start signal is limited to one signal



element generally having the duration of a unit interval. (2) A *signal* to a receiving mechanism to get ready to receive *data* or to perform a *function*.

**start-stop character.** (ISO) A *character* including one *start signal* at the beginning and one or two *stop signals* at the end.

**start-stop transmission.** (ISO) *Asynchronous transmission* such that each group of *signals* representing a *character* is preceded by a *start signal* and is followed by a *stop signal*.

**statement.** (1) In *programming languages*, a *language construct* that represents a *set of declarations* or a *step* in a *sequence of actions*. (2) In *computer programming*, a *symbol string* or other arrangement of symbols. (3) Deprecated term for *instruction*. (4) See *assignment statement*, *command statement*, *conditional statement*, *job control statement*.

**static dump.** A *dump* that is performed at a particular point in time with respect to a machine, often at the end of a *run*, and usually under the control of the *computer operator* or a *supervisory program*.

**static image.** (ISO) Synonym for *background image*.

**staticize.** (1) To convert serial or time-dependent parallel *data* into static form. (2) Loosely, to retrieve an *instruction* and its *operands* from *storage* prior to its *execution*.

**staticizer.** (ISO) A device that converts a time sequence of *signals* into a corresponding *set of simultaneous signals*. Synonymous with *serial-parallel converter*.

**static magnetic cell.** (ISO) Synonym for *magnetic cell*.

**static storage.** (1) *Storage* that does not require periodic *refreshment*. (2) *Storage* other than *dynamic storage*.

**static test mode.** (ISO) That setup mode of an *analog computer* during which special initial conditions are set in order to check the patching, and consequently, the proper operation of all computing devices except *integrators*.

**station.** See *control station*, *data collection station*, *data input station*, *data station*, *inquiry station*, *master station*, *read station*, *remote station*, *slave station*.

**step.** (1) One operation in a *computer routine*. (2) To cause a *computer* to execute one operation. (3) See *job step*, *single step*.

**step-by-step operation.** (ISO) Synonym for *single-step operation*.

**stop instruction.** An exit that specifies the termination of the execution of a *computer program*.

**stop key.** (ISO) In *text processing*, a control that terminates or *interrupts* an operation.

**stop signal.** (1) (ISO) In *start-stop transmission*, a *signal* at the end of a *character* that prepares the receiving device for the reception of a subsequent character. A stop signal is usually limited to one signal element having any duration equal to or greater than a specified minimum value. (2) A *signal* to a receiving mechanism to wait for the next signal.

**storage.** (1) (ISO) The retention of *data* in a *storage device*. (2) (ISO) The action of placing *data* into a *storage device*. (3) A *storage device*. (4) Any medium in which *data* can be retained. See *acoustic storage*, *associative storage*, *auxiliary storage*, *buffer storage*, *cathode ray storage*, *circulating storage*, *cryogenic storage*, *direct access storage*, *dynamic storage*, *electrostatic storage*, *erasable storage*, *immediate access storage*, *internal storage*, *magnetic card storage*, *magnetic core storage*, *magnetic disk storage*, *magnetic drum storage*, *magnetic tape storage*, *magnetic thin-film storage*, *main storage*, *matrix storage*, *mercury storage*, *nonvolatile storage*, *parallel search storage*, *permanent storage*, *pushdown storage*, *pushup storage*, *read-only storage*, *real storage*, *stack storage*, *static storage*, *temporary storage*, *virtual storage*, *volatile storage*, *word-organized storage*.

**storage allocation.** (ISO) The assignment of *storage areas* to specified *data*.

**storage capacity.** (ISO) The amount of *data* that can be contained in a *storage device* measured in *binary characters*, *bytes*, *words*, or other units. For *registers*, the term "register length" is used with the same meaning. Synonymous with *storage size*.

**storage cell.** (1) (ISO) An addressable *storage unit*. (2) The smallest subdivision of *storage* into which a unit of *data* has been or can be entered, in which it is or can be stored, and from which it can be retrieved. (3) Synonymous with *storage element*.

**storage device.** (ISO) A *functional unit* into which *data* can be placed, in which they can be retained, and from which they can be retrieved.

**storage element.** (ISO) Synonym for *storage cell*.

**storage image.** (ISO) The representation of a *computer program* and its related *data* as they exist at the time they reside in *main storage*. Synonymous with *core image*.

**storage indicator.** (ISO) Synonym for *memory indicator*.

**storage location.** (ISO) A position in a *storage device* that is uniquely specified by means of an *address*.

**storage partitioning.** (ISO) Synonym for *memory partitioning*.

**storage protection.** (ISO) Limitation of access to a storage device, or to one or more storage locations, by preventing writing or reading or both.

**storage schema.** In the CODASYL model, the statements of the data storage definition language that describe storage areas, stored records, and any associated indexes and access paths that support the records and sets defined by a given schema.

**storage size.** (ISO) Synonym for storage capacity.

**storage structure.** The configuration of a database resident on computer storage devices after a mapping of the data elements of the logical structure of the database onto their respective physical counterparts, while preserving the relationships and associations that provide the physical means for accessing the information stored in the database.

**storage tube.** (ISO) A type of cathode ray tube that retains a display image without requiring refresh.

**store.** (1) (ISO) To place data into a storage device. (2) (ISO) To retain data in a storage device.

**stored paragraph.** Synonym for boilerplate.

**stored-program computer.** A computer controlled by internally stored instructions, that can synthesize and store instructions, and that can subsequently execute those instructions.

**stored record.** A named collection of fields that represent information stored in a database about a particular entity.

**store indicator.** (ISO) Synonym for memory indicator.

**storing.** (ISO) The action of placing data into a storage device.

**straight line coding.** (ISO) A set of instructions in which there are no loops. (2) (ISO) A programming technique in which loops are avoided by unwinding.

**stratified language.** (1) (ISO) A language that cannot be used as its own metalanguage; for example, FORTRAN. (2) Contrast with unstratified language.

**stream editor.** (ISO) In text processing, a text editor that treats the entire text as a single string, even when the string is broken into lines for viewing purposes.

**streamer.** (ISO) Synonym for streaming tape drive.

**streaming tape drive.** (1) (ISO) A magnetic tape unit especially designed to make a nonstop dump or restore magnetic disks without stopping at interblock gaps. Synonymous with streamer. (2) A tape drive that is designed to maintain continuous tape motion without the requirement to start and stop within an interrecord gap. If tape motion is interrupted for any reason, the drive must reposition the tape by moving in the logical reverse direction far enough to allow the tape to be brought up to speed in the logical forward

direction before it reaches the point at which the preceding operation was terminated.

**streaming tape recording.** A method of recording on magnetic tape that maintains continuous tape motion without the requirement to start and stop within the interrecord gap.

**string.** (1) (ISO) A sequence of elements of the same type, such as characters, considered as a whole. (2) See alphabetic string, binary element string, bit string, character string, null string, symbol string, unit string.

**striping.** In flowcharting, the use of a line across the upper part of a flowchart symbol to signify that a detailed representation of a function is located elsewhere in the same set of flowcharts.

**stroke.** A straight line or arc that is used as a segment of a graphic character.

**stroke centerline.** A line midway between the two stroke edges.

**stroke character generator.** (ISO) A character generator that generates character images composed of line segments.

**stroke device.** An input device that provides a set of coordinates that record the path of the device.

**stroke edge.** In character recognition, the line of discontinuity between a side of a stroke and the background, obtained by averaging, over the length of the stroke, the irregularities resulting from the printing and detecting processes.

**stroke width.** In character recognition, the distance measured perpendicularly to the stroke centerline between the two stroke edges.

**strong typing.** Typing in which each object may take on only those values that are allowed for its type and in which the only operations that may be performed on objects are those that are defined for their types. The type of each object must be known at compile time.

**structure.** See data structure, storage structure, tree structure.

**structured English.** Synonym for pseudocode.

**structured programming.** A technique for organizing and coding programs in which a hierarchy of modules is used, each having a single entry and a single exit point, and in which control is passed downward through the structure without unconditional branches to higher levels of the structure. Three types of control flow are used: sequential, test, and iteration.

**stub card.** A special purpose paper card that has a separable stub attached to a general-purpose paper card. A stub card may be a scored card.

**STX.** The start-of-text character.



**stylus.** (ISO) A *pointer* that is operated by placing it in a *display space* or a *tablet*; for example, a *light pen*, a *sonic pen*, a *voltage pencil*.

**SUB.** The *substitute character*.

**subroutine.** (1) (ISO) A *sequenced set of instructions* or *statements* that may be used in one or more *computer programs* and at one or more points in a *computer program*. The *execution* of a *subroutine* is usually invoked by a *call*. (2) A *routine* that can be part of another *routine*. (3) See *closed subroutine*, *dynamic subroutine*, *open subroutine*, *recursive subroutine*, *reentrant subroutine*.

**subroutine call.** The language construct, in *object code*, that performs the *call function*.

**subschema.** A *subset* of the *schema* that provides a complete description of a *database* from the perspective of a specific application. Synonymous with *view*. See *conceptual subschema*.

**subscript.** A *symbol* that is associated with the name of a *set* to identify a particular *subset* or element of the set.

**subscripting.** In *programming languages*, the use of a *language construct* for accessing an *array element* by means of an *array identifier* and one or more *expressions* which, when evaluated, uniquely specify that element.

**subset.** (1) (ISO) A *set*, each element of which is an element of another specified set. (2) See *proper subset*.

**substitute character (SUB).** (ISO) A *control character* that is used in the place of a *character* that is recognized to be *invalid* or in *error*, or that cannot be represented on a given device.

**subtotal function.** (ISO) In a *calculator*, a *function* that allows the *display* or printing of an interim result of a calculation.

**subtractor.** (1) (ISO) A device whose *output data* are a representation of the difference between the *numbers* represented by its *input data*. (2) See *adder-subtractor*, *full-subtractor*, *half-subtractor*.

**suffix notation.** (ISO) Synonym for *postfix notation*.

**sum check.** (ISO) Synonym for *summation check*.

**summary punch.** (ISO) A *card punch* used to record *data* that were calculated or summarized by another device.

**summation check.** (ISO) A *check* based on the formation of the sum of the *digits* of a *numeral*. The sum of the individual digits is usually compared with a previously computed value. Synonymous with *sum check*.

**summer.** (ISO) A *functional unit* whose *output analog variable* is equal to the sum, or a weighted sum, of two

or more *input analog variables*. Synonymous with *analog adder*.

**summing integrator.** (ISO) A *functional unit* whose *output analog variable* is the integral of a weighted sum of the *input analog variables*, with respect to time or with respect to another *input analog variable*.

**supervisor.** (1) (ISO) Synonym for *supervisory program*, *supervisory routine*. (2) See *overlay supervisor*.

**supervisory program.** (1) (ISO) A *computer program*, usually part of an *operating system*, that controls the execution of other computer programs and regulates the flow of work in a *data processing system*. (2) Synonymous with *executive program*, *supervisor*.

**supervisory routine.** (1) (ISO) A *routine*, usually part of an *operating system*, that controls the execution of other routines and regulates the flow of work in a *data processing system*. (2) Synonymous with *executive routine*, *supervisor*.

**support.** (ISO) To provide the necessary resources for the correct operation of a *functional unit*.

**surge resistance.** (ISO) The capability of a device to remain functionally intact after exposure to overvoltages. Synonymous with *surge withstand capability*.

**surge withstand capability.** (ISO) Synonym for *surge resistance*.

**swapping.** (1) (ISO) A *process* that interchanges the contents of an area of *main storage* with the contents of an area in *auxiliary storage*. (2) See *page swapping*.

**switch.** (1) (ISO) In a *computer program*, a *conditional instruction* and a *flag* that is interrogated by the instruction. (2) In a *computer program*, a *parameter* that controls *branching* and that is bound prior to the *branch point* being reached. Synonymous with *switchpoint*. (3) A device or *programming technique* for making a selection, such as a *toggle*, a *conditional jump*.

**switch code.** (ISO) In *text processing*, a *program instruction* used to combine separately stored *information* by switching between different elements of *recording media* on the same machine or between different sections of *memory*.

**switch core.** (ISO) A core in which the magnetic material generally has a high residual flux density and a high ratio of residual to saturated flux density, with a threshold value of magnetizing force below which switching does not occur.

**switching element.** (ISO) Deprecated term for *logic element*.

**switch indicator.** (ISO) Synonym for *flag*.



**switching function.** (ISO) A *function* that has only a finite number of possible values and whose independent *variables* each have only a finite number of possible values.

**switching variable.** (ISO) A *variable* that may take only a finite number of possible values or states; for example, an unspecified *character* of a set of characters.

**switchpoint.** (ISO) Synonym for *switch* (2).

**syllable.** A *character string* or a *bit string* in a word.

**syllable hyphen.** (ISO) Synonym for *soft hyphen*.

**symbol.** (1) (ISO) A conventional representation of a concept or a representation of a concept upon which agreement has been reached. (2) A representation of something by reason of *relationship*, *association*, or convention. (3) See *abstract symbol*, *flowchart symbol*, *logic symbol*, *mnemonic symbol*.

**symbolic address.** (1) (ISO) An *identifier* in an *assembly language instruction* that represents an address. (2) An address expressed in a form convenient for *computer programming*.

**symbolic addressing.** A method of *addressing* in which the *address part* of an *instruction* contains a *symbolic address*.

**symbolic coding.** The preparation of *routines* and *computer programs* in a *symbolic language*.

**symbolic language.** A *programming language* that expresses *addresses* and *operation codes* of *instructions* in *symbols* convenient to humans rather than to *machine languages*.

**symbolic logic.** (ISO) The discipline in which valid *arguments* and *operations* are dealt with using an *artificial language* designed to avoid the ambiguities and logical inadequacies of *natural languages*. Synonymous with *mathematical logic*.

**symbol manipulation.** The *processing* of *symbols* without regard for their *numeric values*.

**symbol rank.** (ISO) Synonym for *digit place*.

**symbol string.** (ISO) A *string* consisting solely of *symbols*.

**symmetrical list.** (ISO) A *chained list* in which each *data element* contains also *information* for locating the preceding element.

**SYN.** The *synchronous idle character*.

**synchronization pulses.** *Pulses* introduced by *transmission equipment* into the receiving equipment to keep the two equipments operating in step.

**synchronizer.** (ISO) Deprecated term for *input/output controller*.

**synchronous.** (ISO) Pertaining to two or more *processes* that depend upon the occurrence of specific event such as a common timing *signal*.

**synchronous idle character (SYN).** (ISO) A *transmission control character* used in *synchronous transmission systems* to provide a *signal* from which synchronism or *synchronous correction* may be achieved between *data terminal equipment*, particularly when no other *character* is being transmitted.

**synchronous operation.** (1) (ISO) An *operation* that occurs regularly or predictably with respect to the occurrence of a specified event in another *process*, for example, the *calling* of an *input/output routine* that receives control at a precoded *location* in a *computer program*. (2) A mode of operation in which each action is started by a *clock*. (3) Contrast with *asynchronous operation*.

**synchronous transmission.** (1) (ISO) *Data transmission* in which the time of occurrence of each *signal* representing a *bit* is related to a fixed time base. (2) Contrast with *asynchronous transmission*.

**synonym.** In a *conceptual schema language*, one of two or more different *terms* that refer to the same *entity*.

**syntax.** (1) The relationships among *characters* or groups of characters, independent of their meanings or the manner of their interpretation and use. (2) The structure of *expressions* in a *language*. (3) The rules governing the structure of a *language*. (4) The relationship among *symbols*. (5) See also *pragmatics*, *semantics*.

**syntax language.** A *metalanguage* used to specify or describe the *syntax* of another *language*.

**SYSGEN.** (ISO) *System generation*.

**system.** (1) People, machines, and methods organized to accomplish a set of specific *functions*. (2) See *closed system*, *computer system*, *database management system*, *data dictionary system*, *data processing system*, *decimal numeration system*, *embedded system*, *expert system*, *fixed-point representation system*, *fixed-radix numeration system*, *floating-point representation system*, *host language system*, *information resource dictionary system*, *information processing system*, *information system*, *management information system*, *mixed-base numeration system*, *mixed-radix numeration system*, *open system*, *operating system*, *positional representation system*, *programming system*, *pure binary numeration system*, *radix numeration system*, *self-contained system*, *variable-point representation system*.

**system analysis.** (ISO) A systematic investigation of a real or planned system to determine the *functions* of

the system and how they relate to each other and to any other system. Synonymous with systems analysis.

**system description.** (ISO) *Documentation* that describes the *system design* and that defines the organization, essential characteristics, and the *hardware* and *software requirements* of the system.

**system design.** (ISO) A process of defining the *hardware* and *software* architecture, components, *modules*, *interfaces*, and *data* for a system to satisfy specified *requirements*.

**system development.** (ISO) A process that begins with *requirements analysis* and includes *system design*, *implementation*, and *documentation*.

**system documentation.** (ISO) The collection of *documents* that describe the *requirements*, capabilities, limitations, design, operation, and *maintenance* of an *information processing system*.

**system follow-up.** (ISO) The study of the effects of a system after it has reached a stabilized state of operational use. Synonymous with *post-development review*, *post-implementation review*.

**system generation (SYSGEN).** (ISO) The process of selecting optional parts of an *operating system* and of creating a particular operating system tailored to the requirements of a *data processing* installation.

**system integration.** (ISO) The progressive linking and *testing* of system components into a complete system.

**system integrity.** In *data processing*, the state that exists when there is complete assurance that, under all conditions, an *automatic data processing system* is based on the logical correctness of the *hardware* and *software* that implement the protection mechanisms, and *data integrity*.

**system life cycle.** The course of developmental changes through which a system passes from its conception to the termination of its use; for example, the phases and activities associated with the analysis, acquisition, design, development, test, integration, operation, maintenance, and modification of a system.

**system production time.** (ISO) That part of *operating time* that is actually used by some user.

**systems analysis.** (ISO) Synonym for *system analysis*.

**system software.** (ISO) Application-independent software that supports the running of application software.

**system support.** (ISO) The continued provision of services and material necessary for the use and improvement of a system after the system has been adopted.

**system test time.** (ISO) That part of *operating time* during which the *functional unit* is tested for proper operation. Since a functional unit may consist of a *computer* and its *operating system*, system test time in some cases includes the time for testing *computer programs* belonging to the operating system.



## T

**table.** (1) (ISO) An array of *data elements*, each of which may be unambiguously identified by means of one or more *arguments*. (2) A collection of *data elements*, each of which may be uniquely identified by a *label*, by its position relative to the other elements, or by some other means. Synonymous with *dictionary*. (3) See *Boolean operation table*, *decision table*, *function table*, *operation table*, *truth table*.

**table lookup.** A procedure for obtaining the value corresponding to an *argument* from a *table* of values.

**tablet.** (ISO) A special flat surface with a mechanism for indicating positions thereon, normally used as a *locator*.

**tabulation character.** See *horizontal tabulation character*, *vertical tabulation character*.

**tabulator.** (ISO) A device that reads data from a *data medium*, such as *punched cards* or *punched tape*, and produces *lists*, *tables*, or *totals*.

**tag.** (ISO) Synonym for *label*.

**tandem data circuit.** (ISO) A *data circuit* that contains more than two *data circuit-terminating equipments* in a series.

**tape.** See *magnetic tape*, *punched tape*, *punch tape*.

**tape code.** See *perforated tape code*.

**tape drive.** See *magnetic tape drive*.

**tape frame.** (ISO) Synonym for *tape row*.

**tape punch.** (ISO) A *punch* that automatically produces on a *punch tape*, a record of data in the form of *hole patterns*.

**tape reproducer.** (ISO) A device that prepares one tape from another tape by *copying* all or part of the data from the tape that is read.

**tape row.** (ISO) A group of *binary characters* recorded or sensed in parallel on a line perpendicular to the *reference edge* of a tape. Synonymous with *tape frame*.

**tape spool.** (ISO) A cylinder without flanges on which tape may be wound. Synonymous with *hub*.

**tape transport.** See *magnetic tape transport*.

**tape unit.** See *magnetic tape unit*.

**target language.** (ISO) A *language* into which *statements* are translated. Synonymous with *object language*.

**target program.** (ISO) Synonym for *object program*.

**task.** (1) (ISO) In a *multiprogramming* or *multiprocessing* environment, one or more sequences of

*instructions* treated by a *control program* as a unit of work to be accomplished by a *computer*.

**tasking.** See *multitasking*.

**technique.** See *paging technique*.

**telecommunication.** The *transmission* of *signals* over long distances, such as by *telegraph*, *radio*, or *television*.

**temporary storage.** In *computer programming*, *storage locations* reserved for intermediate results.

**tens complement.** (ISO) The *radix complement* in the *decimal numeration system*. Synonymous with *complement-on-ten*.

**term.** In a *conceptual schema language*, a *linguistic object* that may be used to refer to an *entity*.

**terminal.** (1) A point in a *system* or *communication network* at which data can either enter or leave. (2) See *intelligent terminal*, *user terminal*.

**terminal node.** In a *hierarchical model*, a *node* that has no subordinate records.

**ternary.** (1) (ISO) Characterized by a selection, choice, or condition that has three possible different values or states. (2) (ISO) Pertaining to a *fixed radix numeration system* having a *radix* of three.

**ternary incremental representation.** *Incremental representation* in which the value of an increment is rounded to one of three values, plus or minus one *quantum* or zero.

**test.** See *acceptance test*, *benchmark test*, *marginal test*, *usability test*, *validation test*, *verification test*.

**test data.** (ISO) The data that is used for a *check problem*.

**test instruction.** An *instruction* that checks the condition of *data* and sets status or *overflow flag bits* for a subsequent *branch instruction*. In some instances, test and branch are considered a *dual operation* within a single instruction.

**test time.** See *program test time*, *system test time*.

**text.** (1) In *ASCII* and *data communication*, a *sequence of characters* treated as an *entity*, if preceded by one *start-of-text character* and terminated by one *end-of-text character*, respectively. (2) In *text processing*, the *information* that consists of *symbols*, *words*, *phrases*, *sentences*, *paragraphs*, and *tables* that are to be printed or displayed.

**text editing.** In *text processing*, the addition, deletion, or changing of text stored in a *document*.

**text processing.** The use of a *system* to manipulate text by performing *functions* such as *entering*, *editing*, *sorting*, *merging*, *storing*, *retrieving*, *displaying*, and *printing*. Synonymous with *word processing*. The term



**"text processing"** is frequently used to describe the performance of these functions in a large *mainframe computer*. The term "word processing" is frequently used to describe the performance of the same functions on a *personal computer, microcomputer, or standalone word processor*.

**text processor.** A device with associated software or a computer program that allows a user to do text processing. Synonymous with word processor.

**text revision.** The process of changing the information content of a document.

**text string search.** In text processing, a feature that finds one or more places in text where a specified character string is located.

**thermal printer.** A *nonimpact printer* in which the characters are produced by applying heated elements to heat-sensitive paper directly or by melting ink from a ribbon onto plain paper.

**three-bit byte.** (ISO) Synonym for *triplet*.

**three-input adder.** (ISO) Synonym for *full adder*.

**threshold.** (1) A logic operator having the property that if P is a statement, Q is a statement, R is a statement, then the threshold of P, Q, R is true if at least N statements are true, false if less than N statements are true, where N is a specified nonnegative integer called the threshold condition. (2) The threshold condition as in (1).

**threshold element.** (ISO) Synonym for *threshold gate*.

**threshold function.** (ISO) A two-valued switching function of one or more not necessarily Boolean arguments that take a value of one if a specified mathematical function of the arguments exceeds a given threshold value, and zero otherwise. For example, the threshold function:

$$f(a_1, \dots, a_n) = 0 \text{ if } g \leq T$$

$$f(a_1, \dots, a_n) = 1 \text{ if } g > T$$

$$\text{with } g = W_1 a_1 + \dots + W_n a_n$$

where  $W_1, \dots, W_n$  are positive weights for the real arguments  $a_1, \dots, a_n$  and T is the threshold.

**threshold gate.** (ISO) A combinational circuit that performs a threshold operation. Synonymous with threshold element.

**threshold operation.** (ISO) An operation that evaluates a threshold function of its operands.

**throughput.** (1) A measure of the amount of work performed by a computer system over a period of time; for example, the number of jobs per day. (2) See *problem throughput*.

**thumb wheel.** (ISO) In computer graphics, a wheel, movable about its axis, that provides a scalar value. A pair of thumb wheels can be used as a locator.

**time.** See *access time, assembly time, available time, compilation time, down time, environmental loss time, external loss time, incidental time, inoperable time, makeup time, miscellaneous time, operable time, operating time, program production time, program test time, read cycle time, real time, recovery time, rerun time, response time, system production time, system test time, turnaround time, unavailable time, uptime, write cycle time*.

**time out.** An interval of time after which an enforced event occurs. The time out can be prevented by an appropriate signal.

**timer.** (ISO) A register whose contents are changed at regular intervals in such a manner as to measure time. Synonymous with clock register.

**time scale.** See *extended time scale, fast time scale, variable time scale*.

**time scale factor.** (ISO) A number used as a multiplier to transform the real time of a problem into computer time.

**time sharing.** (1) (ISO) An operating technique of a computer system that provides for the interleaving in time of two or more processes in one processor. (2) The concurrent use of a device by a number of users.

**time slicing.** (ISO) A mode of operation in which two or more processes are assigned quanta of time on the same processor.

**time to repair.** See *mean time to repair*.

**token.** (1) (ISO) In a local area network, a group of bits that serves as a symbol of authority passed among data stations to indicate the station temporarily in control of the transmission medium. (2) In programming languages, a language construct that represents an elemental unit of meaning; for example, a literal such as "G25"; a keyword such as PRINT; a separator such as a semicolon.

**token-bus network.** (ISO) A bus network in which a token passing procedure is used.

**token-ring network.** A ring network that allows unidirectional data transmission between data stations by a token passing procedure over one transmission medium such that the transmitted data returns to the transmitting station.

**topdown.** (ISO) Pertaining to a method or procedure that starts at the highest level of abstraction and proceeds toward the lowest level.

**total function.** (ISO) In a calculator, the function that provides the result of a calculation that may be dis-

played or printed and that cannot be reused without manual reentry.

**touch-sensitive.** Pertaining to a device that allows a user to interact with a computer system by touching an area on the surface of the device with a finger, pencil, or other object; for example, a touch-sensitive keypad or screen.

**tournament sort.** A repeated selection sort in which each subset consists of no more than two items.

**trace.** A record of the execution of a computer program; it exhibits the sequence in which the instructions were executed.

**trace program.** (ISO) A computer program that performs a check on another computer program by exhibiting the sequence in which the instructions are executed and, usually, the results of executing the instructions.

**tracing routine.** A routine that provides a historical record of specified events in the execution of a computer program.

**track.** (1) (ISO) On a data medium, a path associated with a single read/write head as data move past the head. (2) See address track, alternate track, alternative track, card track, clock track, feed track, index track, regenerative track.

**track and hold unit.** (ISO) A functional unit whose output analog variable is equal to either the input analog variable or a sample of this variable selected by the action of an external Boolean signal. When tracking, the device follows the input analog variable; when holding, the device holds the value of the input analog variable at the instant of switching. Synonymous with track and store unit.

**track and store unit.** (ISO) Synonym for track and hold unit.

**track ball.** (ISO) Synonym for control ball.

**track density.** (ISO) The number of tracks per unit length, measured in a direction perpendicular to the tracks.

**tracking.** (ISO) In computer graphics, the action of moving a tracking symbol.

**tracking symbol.** (ISO) A symbol on a display surface that indicates the position corresponding to the coordinate data produced by a locator.

**track pitch.** (ISO) The distance between adjacent tracks, measured in a direction perpendicular to the tracks.

**track selection.** (ISO) In text processing, selection that enables specific tracks on the recording medium to be accessed.

**trail.** See audit trail.

**trailer card.** A card that contains information related to data on preceding cards.

**trailer label.** (ISO) Synonym for end-of-file label.

**trailing decision.** A loop control that is executed after the loop body.

**trailing end.** The end of a perforated tape that last enters a perforated-tape reader.

**trailing zero.** In positional notation, a zero in a less significant digit place than the digit place of the least significant nonzero digit of a numeral.

**train.** See pulse train.

**transaction.** (1) A command, message, or input record that explicitly or implicitly calls for a processing action, such as updating a file. (2) An exchange between an end user and an interactive system. (3) In a database management system, a unit of processing activity that accomplishes a specific purpose such as a retrieval, an update, a modification, or a deletion of one or more data elements of a storage structure.

**transaction file.** A file that contains relatively transient data, that, for a given application, is processed together with the appropriate master file.

**transaction processing.** A sequence of operations on a database that is viewed by the user as a single, individual operation.

**transcribe.** (ISO) To copy data from one data medium to another, converting the data as necessary for acceptance by the receiving medium.

**transducer.** A device for converting energy from one form to another.

**transfer.** (1) (ISO) In text processing, the movement of selected recorded text from one element of a recording medium to another. (2) (ISO) To send data from one storage location to another. Synonymous with move. (3) See block transfer, control transfer.

**transfer check.** A check on the accuracy of a data transfer.

**transfer interpreter.** (ISO) A device that prints on a punched card the characters corresponding to hole patterns punched in another card.

**transfer time.** (1) (ISO) The time interval between the instant at which a transfer of data starts and the instant at which the transfer is completed. (2) See Figure 1.

**transform.** (ISO) To change the form of data according to specified rules, without significantly changing the meaning of the data.

**transformation.** See key transformation, signal transformation.

**translate.** (ISO) To transform all or a portion of a program expressed in one programming language into



another programming language, or into some other representation suitable for *execution*.

**translate phase.** (ISO) The logical subdivision of a *run* that includes the *execution* of the *translator*.

**translating program.** (ISO) Synonym for *translator*.

**translating time.** (ISO) The elapsed time taken for the *execution* of a *translator*.

**translation.** (ISO) In *computer graphics*, the application of a constant displacement to the position of one or more *display elements*.

**translator.** (1) (ISO) A *computer program* that *translates* from one *language* into another language and in particular from one *programming language* into another programming language. Synonymous with *translating program*. (2) See *address translator*.

**transliterate.** To convert the *characters* of one *alphabet* to the corresponding characters of another alphabet.

**transmission.** (1) The sending of *data* from one place for reception elsewhere. (2) See *anisochronous transmission*, *asynchronous transmission*, *burst transmission*, *data transmission*, *duplex transmission*, *half-duplex transmission*, *isochronous transmission*, *parallel transmission*, *serial transmission*, *simplex transmission*, *start-stop transmission*, *synchronous transmission*.

**transmission block.** (ISO) A group of *bits* or *characters* transmitted as a unit, usually with an encoding procedure for *error control* purposes.

**transmission-block character.** See *end-of-transmission-block character*.

**transmission control character.** A *control character* that is used to control or facilitate *transmission* of *data* between *data terminal equipments*. Synonymous with *communication control character*.

**transmission frame.** (1) (ISO) A *data structure*, beginning and ending with *delimiters*, that consists of *fields* predetermined by a *protocol* for the *transmission* of *user data* and control data. (2) See Figure 20.

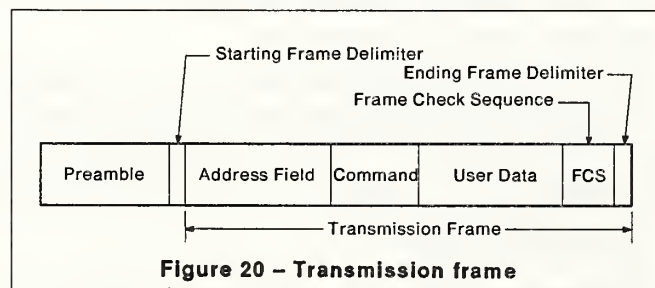


Figure 20 - Transmission frame

**transmission line.** (ISO) Synonym for *line*.

**transmission medium.** (ISO) The physical medium that conveys *data* between *data stations*; for example,

the medium may be twisted pair wire, optical fiber, or coaxial cable.

**transmitter.** See *universal receiver-transmitter*.

**transportability.** Synonym for *portability*.

**transverse parity check.** (ISO) A *parity check* on a *column* of *binary digits* that are members of a *set* that forms a *matrix*; for example, a parity check on the set of *bits* on a *tape row*.

**trap.** An unprogrammed *conditional jump* to a specified *address* that is automatically activated by *hardware*; the *location* from which the jump was made is recorded.

**tree network.** (1) (ISO) A *network* in which there is only one *path* between any two *nodes*. (2) See Figure 21.

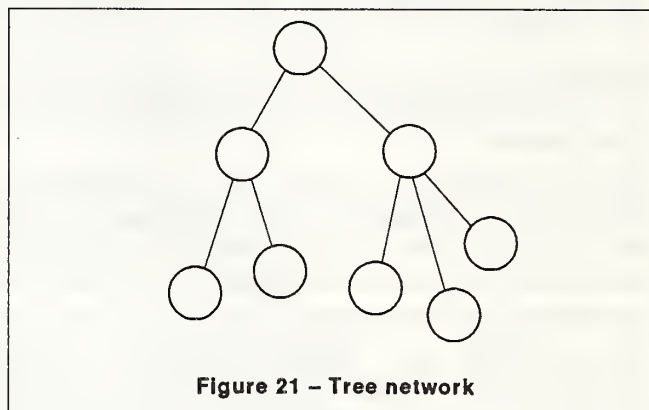


Figure 21 - Tree network

**tree search.** (ISO) In a *tree structure*, a search in which it is possible to decide, at each step, which part of the tree may be rejected without a further search.

**tree structure.** A hierarchical organization in which each *node* is considered to be an ancestor of all lower-level nodes to which it is connected; the root, or base node, is an ancestor of all other nodes.

**tributary station.** (ISO) On a *multipoint connection* or a *point-to-point connection* using *basic mode link control*, any *data station* other than the *control station*.

**trigger circuit.** (1) (ISO) A circuit that has a number of *unstable states* and at least one *stable state* and is designed so that a desired transition can be initiated by the application of a suitable *pulse*. (2) See *bistable trigger circuit*, *data circuit*, *monostable trigger circuit*, *tandem data circuit*.

**triple-length register.** (ISO) Three *registers* that function as a single register. Synonymous with *triple register*.

**triple precision.** (ISO) Characterized by the use of three *computer words* to represent a *number* in accordance with required *precision*.

**triple register.** (ISO) Synonym for *triple-length register*.



**triplet.** A byte composed of three *binary elements*.  
Synonymous with three-bit byte.

**truncated binary exponential backoff.** (ISO) In *carrier sense multiple access with collision avoidance networks* and in *carrier sense multiple access with collision detection networks*, the *algorithm* used to schedule retransmission after a *collision*, such that the retransmission is delayed by an amount of time derived from the *slot time* and the number of attempts to retransmit.

**truncation.** The *deletion* or omission of a leading or a trailing portion of a *string* in accordance with specified criteria.

**truncation error.** (ISO) An error due to *truncation*.

**truth table.** (1) (ISO) An *operation table* for a *logic operation*. (2) A *table* that describes a *logic function* by listing all possible combinations of *input* values, and indicating, for each combination, the *output* value.

**tumbling.** (ISO) A dynamic *display* of the *rotation* of *display elements* about an axis whose orientation is continuously changing in space.

**tuple.** In a *relation*, the part that identifies an *entity* and its *attributes*. A tuple is one row of a *relation table*. See also *n-tuple length register*.

**Turing machine.** (1) A *mathematical model* of a device that changes its internal state and reads from, writes on, and moves a potentially infinite tape, all in accordance with its present state, thereby constituting a model for computer-like behavior. (2) See *universal Turing machine*.

**turnaround time.** (ISO) The elapsed time between the submission of a *job* and the return of the complete *output*.

**turn-on stabilizing time.** (ISO) The time interval between the instant power is applied to a device and the instant at which the device performs according to its operating specifications.

**twelve punch.** A *punch* in the top row of a *Hollerith card*. Synonymous with *y punch*.

**two-bit byte.** (ISO) Synonym for *doublet*.

**two-input adder.** (ISO) Synonym for *half adder*.

**two-out-of-five code.** (ISO) A *binary-coded decimal notation* in which each *decimal digit* is represented by

a *binary numeral* consisting of five *binary digits* of which two are of one kind, conventionally ones, and three are of the other kind, conventionally zeros. The usual *weights* are 0-1-2-3-6, except for the representation of zero, which is then 01100.

**twos complement.** (ISO) The *radix complement* in the *pure binary numeration system*.

**two-way alternate communication.** (ISO) *Data communication* such that *data* are transferred in both directions, one direction at a time.

**two-way simultaneous communication.** (ISO) *Data communication* such that *data* are transferred in both directions at the same time.

**type.** (1) In *text processing*, a raised *character* on a *type element* used to make an imprint. (2) In *programming languages*, a name given to a set of objects and a set of operations allowed on those objects. (3) See *attribute type*, *item type*, *record type*, *set type*.

**type (of an entity).** In a *conceptual schema language*, the *proposition* establishing that an *entity* is a member of a particular *class of entities*, implying as well that there is such a class of entities.

**type bar.** (ISO) A bar, mounted on an *impact printer*, that holds *type slugs*. Synonymous with *print bar*.

**type element.** A device that carries one or more *types*.

**typeface.** The raised printing surface of a *type*.

**type slug.** A *type element*, usually having two *types* arranged one above the other for mounting on a *type bar*.

**typewriter.** (ISO) A machine designed to produce print-like *text* on paper or similar material as a result of an operator manually depressing *keys consecutively* on a *keyboard*.

**typewriter key.** Synonym for *typing key*.

**typing.** In *programming languages*, assigning a specific *type* to each *object*; for example, *integer*, *real*, *logical*. See *strong typing*, *weak typing*.

**typing key.** A *numeric* or *letter key* such as those used on conventional *typewriters*. Synonymous with *typewriter key*.

**typing line.** The *writing line* on a *typewriter*.

**typing position.** The imprint position on a *typewriter*.



# U

**ultrafiche.** In *micrographics*, *microfiche* with images reduced more than ninety times.

**unary operation.** (ISO) Synonym for *monadic operation*.

**unary operator.** (ISO) Synonym for *monadic operator*.

**unavailable time.** (ISO) From the point of view of a *user*, the time during which a *functional unit* cannot be used.

**unbalanced merge sort.** A *merge sort*, which is an *external sort*, such that the sorted *subsets* created by the *internal sorts* are unequally distributed among some of the available *auxiliary storage devices*. The subsets are merged onto the remaining auxiliary storage devices and the process repeated until all *items* are in one sorted set.

**unconditional branch.** (ISO) A *control transfer* that never requires a decision.

**underflow.** (1) (ISO) The state in which a *calculator* shows a zero indicator for the most significant part of a *number* while the least significant part of the number is dropped; for example, if the calculator *output capability* is four *digits*, the number .0000432 will be shown as .0000. (2) See *arithmetic underflow*.

**underflow indicator.** (ISO) On a *calculator*, a visual indication that the calculator is in *underflow* state.

**underscore.** (ISO) A line that is printed or *displayed* directly under a *character* or group of *characters*.

**undo.** (ISO) A *function* that enables a *user* to cancel the effects of the most recently *executed command* or *commands*. Some commands are irreversible.

**unit.** (1) A device that has a special *function*. (2) A basic element. (3) See *arithmetic and logic unit*, *arithmetic unit*, *functional unit*, *input/output unit*, *input unit*, *instruction control unit*, *logic unit*, *magnetic disk unit*, *main drum unit*, *magnetic tape unit*, *output unit*, *raster unit*.

**universal receiver-transmitter.** A circuit used in *asynchronous*, *synchronous*, or combined *synchronous* and *asynchronous data communication* applications to provide all the necessary logic to receive *data* serial-in parallel-out and to transmit parallel-in serial-out; usually it transmits by means of *duplex transmission*, and can accommodate various *word lengths*.

**universe of discourse.** In a *conceptual schema language*, all of the *entities* of interest that have been, are, or ever might be.

**unit string.** (ISO) A *string* that consists of only one *entity*.

**universal set.** (ISO) The set that includes all of the elements of concern in a given study.

**universal Turing machine.** A *Turing machine* that can *simulate* any other Turing machine.

**unpack.** (ISO) To recover the original form of *data* from data that was *packed*.

**unrecoverable error.** (ISO) An *error* for which *recovery* is impossible without the use of *recovery techniques* external to the *program* or *run*.

**unstable state.** (ISO) In a *circuit*, a state in which the circuit remains for a finite period of time at the end of which it returns to a *stable state* without the application of a *pulse*. Synonymous with *metastable state*, *quasistable state*.

**unstratified language.** (1) (ISO) A *language* that can be used as its own *metalanguage*; this concept encompasses most *natural languages*. (2) Contrast with *stratified language*.

**unwind.** To state explicitly and in full, without the use of modifiers, all the *instructions* that are involved in the execution of a *loop*.

**uplink.** (ISO) Pertaining to *data transmission* from a *data station* to the *headend*.

**upper curtate.** The adjacent *card rows* at the top of a *punch card*.

**uptime.** (ISO) Synonym for *operable time*.

**usability test.** (ISO) A *test* to determine that an *implemented system* fulfills its *functional purpose* as determined by its *end users*.

**user.** (1) Any person, organization, or *functional unit* that uses the services of an *information processing system*. See *end user*. (2) In a *conceptual schema language*, any person or any thing that may issue or receive *commands* and *messages* to or from the *information system*.

**user class of service.** (ISO) A category of *data transmission service* provided by a *data network* in which the *data signalling rate*, the *data terminal equipment* operating mode, and the *code structure*, if any, are standardized.

**user coordinate.** (ISO) A coordinate specified by a *user* and expressed in a coordinate system that is device independent.

**user facility.** (ISO) A set of *functions* available on demand to a *user* and provided as a part of a *data network transmission service*. Some facilities may be available on a *per-call* basis, and others may be assigned for an agreed-upon period at the request of the user. On certain assigned facilities, *per-call options* may also be available.



**user-friendly.** Pertaining to ease and convenience of use.

**user's guide.** (ISO) Synonym for *user manual*.

**user interface.** The part of a *system* with which a *user* interacts.

**user manual.** (ISO) *Documentation* that describes how to use a *functional unit*, and that may include description of the rights and responsibilities of the *user*, the owner, and the supplier of the unit. Synonymous with *user's guide*.

**user terminal.** (ISO) An *input/output unit* by which a *user* communicates with a *computer*.

**utility program.** (ISO) A *computer program* in general support of the *processes* of a *computer*; for example, a *diagnostic program*, a *trace program*, a *sort program*. Synonymous with *service program*.

**utility routine.** (ISO) A *routine* in general support of the *processes* of a *computer*; for example, an *input routine*. Synonymous with *service routine*.

# V

**vacuum column.** (ISO) In a *magnetic tape drive*, a cavity in which low air pressure is maintained so as to attract a tape loop between the reel and the driving mechanism.

**validation.** (1) (ISO) Tests to determine whether an *implemented system* fulfills its *requirements*. (2) See *data validation*.

**valuator.** (ISO) An *input unit* that provides a *scalar value*; for example, a *thumb wheel*, a potentiometer.

**value.** Synonym for *data value*.

**variable.** (1) A quantity that can assume any of a given set of values. (2) In a *conceptual schema language*, a term that refers to unspecified, indeterminate entities in the universe of discourse. (3) See *analog variable*, *loop-control variable*, *switching variable*.

**variable function generator.** (ISO) A *function generator* in which the *function* it generates may be set by the user before or during computation.

**variable pitch.** Deprecated term for *proportional spacing*.

**variable-point representation system.** (ISO) A *radix numeration system* in which the *radix point* is explicitly indicated by a *special character* at that position.

**variable time scale.** In *simulation*, the time scale used in *data processing* when the *time scale factor* is not constant during a *run*.

**variant part.** In *programming languages*, that part of a *record* whose *data objects* may be defined in alternative ways.

**variation name.** (1) In an *information resource dictionary*, a *character string* used to identify each of several logically related entities with the same assigned *access name* or *descriptive name*. (2) A component of the *version identifier* of an entity in an *information resource dictionary*.

**VDU.** *Video display unit*, *visual display unit*.

**vector.** (1) (ISO) A quantity usually characterized by an ordered set of *scalars*. (2) A directed line segment. (3) See *absolute vector*, *incremental vector*. (4) Contrast with *scalar*.

**vector generator.** (ISO) A *functional unit* that generates directed line segments.

**vector processor.** (ISO) Synonym for *array processor*.

**Veitch diagram.** (ISO) A means of representing *Boolean functions* in which the number of *variables* determines the number of squares in the diagram; the number of squares needed is the number of possible

states, namely, two raised to a power determined by the number of variables.

**Venn diagram.** (ISO) A diagram in which sets are represented by regions drawn on a surface.

**verification.** (1) (ISO) Tests of a *system* under development to prove that it meets all of its specified *requirements* for a particular stage of the *system life cycle*. (2) See *keystroke verification*.

**verifier.** A device that checks the correctness of transcribed *data*, usually by comparing them with a second transcription of the same data or by comparing a retranscription with the original data.

**verify.** (1) To determine whether a transcription of *data* or other *operation* has been accomplished accurately. (2) To check the results of *keypunching*.

**vertical feed.** Pertaining to the entry of a *punch card* into a *card feed* with a short edge first.

**vertical formatting.** (ISO) In *text processing*, the *automatic* positioning of text vertically within definable limits.

**vertical form skip control.** (ISO) Synonym for *first line find*.

**vertical magnetic recording.** (ISO) Synonym for *perpendicular magnetic recording*.

**vertical tabulation character (VT).** A *format effector* that causes the *printing position* or *display position* to move to the corresponding position on the next of a series of predetermined lines.

**video display unit (VDU).** Synonym for *visual display unit*.

**view.** (1) In an *information resource dictionary*, the combination of a *variation name* and *revision number* that is used as a component of an *access name* or of a *descriptive name*. (2) Synonym for *subschema*.

**viewing transformation.** (ISO) Synonym for *window/viewport transformation*.

**viewport.** (ISO) A predefined part of a *display space*.

**virgin medium.** (ISO) Synonym for *blank medium*.

**virtual address.** (ISO) The *address* of a *storage location* in *virtual storage*.

**virtual call facility.** (ISO) A *user facility* in which a *call set-up* procedure and a *call-clearing* procedure determine a period of communication between two *data terminal equipments* in which *user's data* are transferred in the *network* in *packet mode* operation. All the users' data is delivered from the network in the same order in which it is received by the network. This facility requires end-to-end transfer control of packets within the network. Data may be delivered to the network before the call set-up has been completed, but

they are not delivered to the destination address if the call set-up attempt is unsuccessful. Multiaccess data terminal equipments may have several virtual calls in operation at the same time.

**virtual.** Pertaining to a conceptualized *functional unit* whose *functions* are accomplished by a real functional unit.

**virtual machine (VM).** A conceptualized *computer* and its associated devices, controlled by a real *operating system*, that appears to be at the exclusive use of a particular *user*.

**virtual push button.** (ISO) *Display elements* used to *simulate a function key* by means of a *pick device*. Synonymous with light button.

**virtual space.** (ISO) In *computer graphics*, a space in which the coordinates of the *display elements* are expressed in a device-independent manner.

**virtual storage.** (ISO) The *storage space* that may be regarded as *addressable main storage* by the *user* of a *computer system* in which *virtual addresses* are *mapped* into *real addresses*. The size of virtual storage is limited by the addressing scheme of the computer system and by the amount of *auxiliary*

*storage* available, and not by the actual number of main storage *locations*.

**visual display unit (VDU).** A device with a *display screen*, usually equipped with a *keyboard*; for example, a *cathode ray tube display*, *light-emitting diode display*, *liquid crystal display*, or *plasma panel*. Synonymous with monitor, video display unit.

**VM.** *Virtual machine*.

**void.** In *character recognition*, the inadvertent absence of ink within a *character outline*.

**volatile storage.** (ISO) A *storage device* whose contents are lost when power is cut off.

**volatility.** See *data volatility*.

**volume.** A portion of *data*, together with its data carrier, that can be handled conveniently as a unit; for example, a *reel of magnetic tape*, a *disk pack*.

**volume header.** (ISO) Synonym for *beginning-of-volume label*.

**volume label.** (ISO) Synonym for *beginning-of-volume label*.

**VT.** The *vertical tabulation character*.



# W

**waiting time.** (ISO) Synonym for *latency*.

**weak typing.** In *programming languages*, *typing* that is not strongly enforced. Weak typing allows objects to take on values not normally allowed for their *type*. Types of all objects may not be known at *compile* time.

**weight.** The factor by which the value represented by a *character* in a *digit place* in *positional representation* is multiplied to obtain its additive contribution in the representation of a *real number*. Synonymous with *significance*.

**window.** (1) (ISO) In *computer graphics*, a predefined part of a *virtual space*. (2) A portion of a *display surface* in which *display images* pertaining to a particular application can be presented. Different applications can be displayed *simultaneously* in different windows.

**window/viewport transformation.** (1) (ISO) A *mapping* of the boundary and contents of a *window* into the boundary and interior of a *viewport*. Synonymous with *viewing transformation*. (2) See Figure 22.

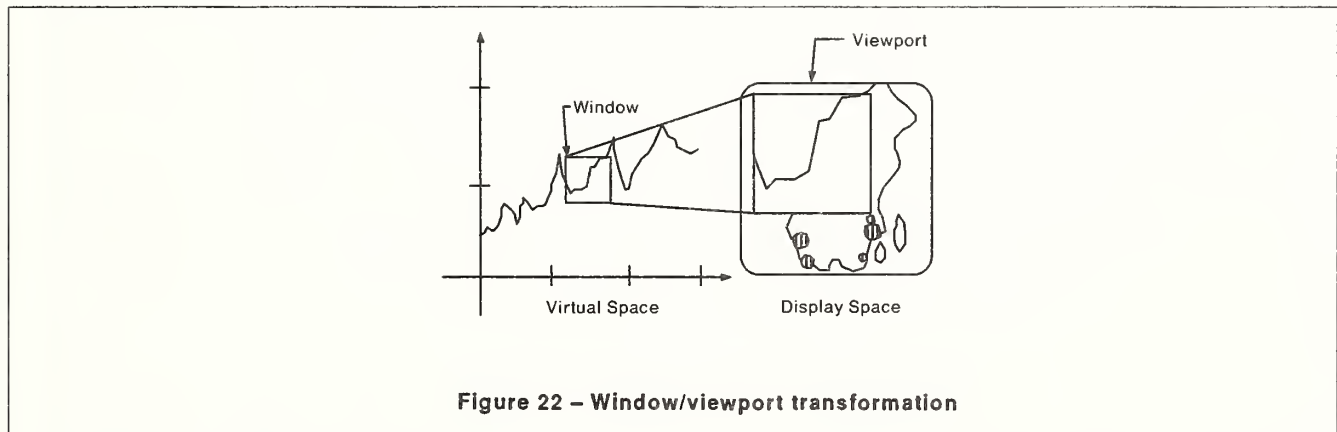


Figure 22 – Window/viewport transformation

**wire frame representation.** (ISO) A mode of *display* showing all edges of a three-dimensional object without distinguishing *hidden lines*.

**word.** (1) (ISO) A *character string* or a *bit string* considered to be an *entity* for some purpose. (2) See *alphabetic word*, *computer word*, *double word*, *halfword*, *index word*, *machine word*, *numeric word*, *parameter word*, *reserved word*.

**word control.** (ISO) In *text processing*, the capability to operate one *word* at a time; for example, *skip*, *move*, *delete*, *print*.

**word length.** The number of *characters* or *bits* in a *word*.

**word-organized storage.** A *storage device* in which *data* can be stored or from which *data* can be retrieved in units of *computer words*.

**word processing.** (ISO) Synonym for *text processing*.

**word processor.** (ISO) Synonym for *text processor*.

**word wrap.** (1) (ISO) In *text processing*, a *function* that enables *text* entered after the last *character* position on a *line* to be placed on the next line. (2) Synonymous with *wraparound* (2).

**work space.** (ISO) That portion of *main storage* that is used by a *computer program* for temporary *storage* of *data*. Synonymous with *working space*.

**working space.** (ISO) Synonym for *work space*.

**workstation.** A station that is operated by a *user* to perform an application such as *text processing*.

**world coordinate.** (ISO) A device-independent Cartesian coordinate system used by the *application program* for specifying graphical *input* and *output*.

**WORM.** Write-once-read-many; usually in the context of *optical disks*.

**wraparound.** (1) (ISO) Forcing that part of an image that lies outside an edge of a *display space* to be displayed at the opposite edge of that space. (2) Synonym for *word wrap*.

**write.** To make a permanent or transient recording of *data* in a *storage device* or on a *data medium*.

**write cycle time.** (ISO) The minimum time interval between the starts of successive *write* cycles of a *storage device* that has separate *reading* and *writing* cycles.

**write head.** (ISO) A *magnetic head* capable of *writing* only.

**write protection label.** (ISO) A removable *label*, the presence or absence of which on a *diskette* prevents *writing* on the diskette.

**writing.** The action of making a permanent or transient recording of *data* in a *storage device* or on a *data medium*.

**writing line.** An imaginary line on which the bottom of a *displayed*, printed, or typed *character*, excluding *descenders*, rests.

**WYSIWYG.** (What-you-see-is-what-you-get) In *text processing* and *desktop publishing*, a capability that enables a *user* to *display* a page exactly as it will be printed.

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## X

**X-datum line.** An imaginary line, used as a reference edge, along the top edge of a *punch card*, that is, a line along the edge nearest the *twelve-punch row* of a *Hollerith card*.

**x-punch.** Synonym for *eleven punch*.





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## Y

**Y-datum line.** An imaginary line, used as a reference edge, passing along the right edge of a *punch card* at right angles to the *X-datum line*.

**y-punch.** Synonym for *twelve punch*.





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**Z**

**zero.** (1) (ISO) In *data processing*, the *number* that when added to or subtracted from any other number does not alter the value of that other number. Zero may have different representations in *computers*, such as positively or negatively signed zero, which may result from subtracting a signed number from itself, and floating-point zero, in which the *fixed point part* is zero while the *exponent* in the *floating-point representation* may vary. (2) See *leading zero*, *trailing zero*.

**zero-address instruction.** (ISO) An *instruction* that has no *address* because the address is implied or no address is required.

**zerofill.** (ISO) To fill unused *storage locations* with the representation of the *character* denoting zero.

**zero punch.** A *punch* in the third row from the top of a *Hollerith card*.

**zero suppression.** (ISO) The elimination of nonsignificant zeros from a *numeral*.

**z-fold paper.** Synonym for *fanfold paper*.

**zig-zag fold paper.** Synonym for *fanfold paper*.

**zone.** See *line-end zone*, *line-ending zone*, *margin adjust zone*.

**zone punch.** (ISO) A hole punched in one of the upper three rows of a twelve-row *punch card*.

**zooming.** (ISO) The progressive *scaling* of an entire *display image* to give the visual impression of movement of all or part of a *display group* toward or away from an observer.







